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This project had the objective of developing preliminary size selection algorithms necessary to generate computer software for determining the size clothing required for a specific military recruit. Body measurement information generated by a 3D full human body scanner provided the input to drive the size selection software.			
Southern Polytechnic State University worked with Cyberware, Inc in support of this effort for the Apparel Research Network (ARN).			
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DEFENSE LOGISTICS AGENCY
APPAREL RESEARCH NETWORK (ARN) PROGRAM
SIZE SELECTION RULES FOR ARNSCAN
FINAL TECHNICAL REPORT

Submitted to:

Defense Logistics Agency
Attention: Julie Tsao
Research & Development Enterprise Division
J-339, Room 3135
8725 John J. Kingman Rd.
Ft. Belvoir, VA 22060-6221

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Name of PI	Carol Ring
E-mail	<u>Cring@spsu.edu</u>
Phone	770-528-3173
Fax	770-528-7556
Address	Southern Polytechnic State University Apparel & Textile Engineering Technology 1100 South Marietta Parkway Marietta, Georgia 30060-2896

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APPENDIX PRELIMINARY SIZE SELECTION RULE METHODOLOGY

EXECUTIVE SUMMARY

This report documents the work of Southern Polytechnic State University (SPSU) as part of a consortium of contractors in the Defense Logistics Agency Apparel Research Network (ARN). The research performed was in support of previous efforts of ARN partners in their endeavor to develop a software system that could issue acceptable sizes for military apparel using measurements extracted from a 3-D full body scanner.

SPSU previous work began by investigating methodology for generating size selection tables in 1998 and continued through 2000. This work was being performed in support of the 3-D body scanning and measurement extraction software being developed by other ARN partners, specifically Cyberware the provider of the 3-D body scanning equipment. The algorithms developed for the Male U.S. Marine Corp Dress Uniform were implemented in the issue line at the Marine Corp Recruit Depot, San Diego. The ARNScan system measures recruits and issues garments deemed acceptable by MCRD-SD in accuracy and speed. At present, the Marine recruits are being issued the Dress Uniform as well as several other items of clothing utilizing the 3-D full body scanner and size selection tables as a result of ARN research.

The sections of this report describe the methodology of size selection generation as well as examples of rules generated for each of the selected garments. The following is a brief overview of the report by section.

Section 1.0 INTRODUCTION

The project included a review of the female issue process for four services as well as the preliminary size selection rule generation for selected services and clothing items. This was accomplished through scheduling a visit at each of the selected bases and also documenting the clothing issue process. Preliminary size selection rule generation incorporated information provided by service staff as well as military standards and garment patterns.

Section 2.0 Female Measurement Extraction

Female measurement investigation began with selection of the critical measurements required to perform size selection of military garments by C. Ring and Cyberware staff. A test group of young females were brought into the Cyberware facility in Monterey where they were manually measured and then processed through the 3-D body scanner. Cyberware staff in the process of evaluating the measurement extraction routines for females evaluated this data.

Section 3.0 Female Garment Selection

Contact was made with a recruit center for the Marine Corp, Army, Navy, and Air Force. Requests for any documented information on the fit and issue process were made to each of the services. Each agreed to investigate and determine what was available and provide a copy to C. Ring.

Section 4.0 Recruit Depot Female First Fit

Visits to view the female fit process for first issue of dress clothing were planned at each of the following bases: Marine Corp, Parris Island, SC - Army, Fort Jackson, SC - Navy, Great Lakes, IL - Air Force, Lackland San Antonio, TX. Ring and Safar completed the planned visits and documented the process as well as the layout of the issuing area.

Section 5.0 Marine Female Size Selection

Preliminary size selection rules were generated for the female Marine Corp recruits. Patterns, military standards, and samples were reviewed. The garments included in the investigation included the dress skirt, slack, coat, and shirt.

Section 6.0 Navy Female Size Selection

Preliminary size selection rules were generated for the female Navy recruit. The rule methodology was documented for a list of garments issued. Included were the dress skirt, slack, coat, and jumper as well as the coverall, overcoat, and all weather coats.

Section 7.0 Navy Male Size Selection

Preliminary size selection rules were generated for the male Navy recruit. Military standards as well as fit information gathered from the clothing issue staff were reviewed. Included in the items for size selection generation were the dress trouser, jumper, and shirt as well as the coverall, overcoat, and all weather coats.

1.0 INTRODUCTION

1.1 Purpose, Scope and Objectives

This project work encompasses two areas: a review of the female issue process and the development of size selection tables for specific items. The following report describes Southern Polytechnic State University's research in the area of the process of female service dress uniform clothing issue. The second area of research was conducted based on service and item as selected by program management. Southern Polytechnic staff, Carol Ring, conducted the initial investigation by visiting a recruit base for each of the services: Marine, Army, Navy, and Air Force. She was joined in these visits by Michal Safar, MTIAC, who has provided portions of the information from the base visits for this report.

The objective of this research was to compare the issue process for all female recruit dress clothing issues and to generate preliminary size selection rule algorithms for selected garments. These preliminary rules would be available to be imported into the 3-D body scanner and measurement extraction software, ARNScan, which was developed as part of the Apparel Research Network project.

1.2 Methodology and Sources

There are several components that affect the fit of clothing items but the most quantifiable are the body measurements and the garment measurements. The difference between these two numbers is the fit ease or how the wearer perceives fit. When patterns are generated for the human body, fit ease is determined based on that particular item. The garment must allow fit ease based on the purpose of the clothing item and the type of fabric being used. For example, a t-shirt worn for work purposes

would generally allow more fit ease than a dress coat only worn at formal occasions. Therefore, the visual appearance, the comfort of the garment, and the purpose of the garment are all considered as the design of the garment is created.

Specific measurements for each garment were used for generating the size selection algorithms. This selection was based on the most critical measurement being the most influential in the size selection, such as, the shoulder and chest area of a dress coat. Information pertaining to the preferred fit of each garment was gathered from service staff, service documentation, Military Specifications, and fit manuals where available. This information was used in conjunction with the finished pattern measurements extracted from the patterns provided by DSCP and the body measurement charts to generate preliminary size selection tables.

2.0 FEMALE MEASUREMENT EXTRACTION

The previous research and development in measurement extraction was primarily for the male recruit. The research presented here includes the initial investigation into female measurement extraction. C. Ring partnered with Cyberware in preparation for female measurement evaluations. Cyberware and SPSU developed a measurement list in preparation for manual measuring and also scanning a sample group of female subjects. Ring met with Cyberware staff and they reviewed the measurement list and the definitions of each before preparing the final documents for the scheduled measuring/scanning session.

Cyberware had enlisted the assistance of two people from the local college that would assist in the measurement process during the scheduled scanning sessions. The planning and practice session included L. McLennan of Cyberware, C. Ring of SPSU, and the two personnel from the local college. Twelve subjects were scheduled to participate in the session. Cyberware Interim Progress Reports and Final Technical Report give more detail on the protocol and results for this sampling session. These reports are posted on the ARN website: <http://www.arn.iitri.org>

3.0 FEMALE GARMENT SELECTION

The original statement of work called for preliminary work on female garment selection. This was later expanded to include selected male garments. See section 7.0. Contact was made with a recruit center for the Marine Corp, Army, Navy, and Air Force. Requests for any documented information on the fit and issue process was requested from each of the services. Each agreed to investigate and determine what was available and provide a copy to Ring.

Current military specifications were requested from DSCP. The garment measurements provided in the document for quality control purposes were limited. The garment measurements and the body measurements used in size selection that were not provided by the standards were extracted from military patterns to be used in the development of the size selection tables.

The following table lists the measurements that could be used by ARNScan for size selection. This measurement list is not in the order of priority for all services.

Skirt				Waist	Hip	Thighs	Height
Slack				Waist	Hip	Thigh	Height
Shirt	Bust	Across Shoulder	Neck	Waist	Hip	Center Back Sleeve Length	Height
Coat	Bust	Across Shoulder		Waist	Hip		Height

The following table indicates the measurements available in the military specification. The coat and shirt are the most incomplete. The across shoulder, waist, and hip are used in size selection and are not available from all of the services.

Resource Documents			Finished Dimensions						
MIL #	Service	Item	#1	#2	#3	#4	#5	#6	#7
MIL-S-24948A	Navy	Slacks with Side Pockets	Waist	Hip	Inseam	Knee (on type II)			
PD-98-10	Army	Slacks, Dress, Polyester/Wool	Waist	Hip	Inseam	Outseam			
PD-93-6	Air Force	Slacks, Women's	Waist	Hip	Inseam	Outseam	Knee	Bottom	
MIL-S-29432B	Marine	Slacks, Women's	Waist	Hip	Inseam	Knee	Bottom		
MIL-S-29629(NU)	Navy	Skirt with Welt Pockets	Waist	Hip	Length (unhemmed)		Sweep (unhemmed)		
MIL-S-29631	Navy	Skirt, Blue Dress	Waist	Hip	Length (unhemmed)		Sweep (unhemmed)		
A-A-55304	Army	Skirt, Dress, Polyester/Wool	Waist	Hip	Length				
PD-96-08	Air Force	Skirts, Women's, Service Dress	Half Waist (relaxed and extended)	Half Hip	Length		Half Sweep		
MIL-S-29429B	Marine	Skirt	Waist	Seat	Length				
MIL-S-87056A	Navy	Shirt, Blue Dress, Long Sleeve	Bust	Back Length	Collar	Sleeve Length			
MIL-S-80755B(NU)	Navy	Shirt, White Dress, Short Sleeve	Bust	Back Length	Collar	Sleeve Length			
A-A-55283	Army	Shirt, Tuck In	Half Bust	Back Length	Sleeve Length	Sweep	Short Sleeve Length		
A-A-55263	Air Force	Shirt, Women's, Tuck-in	Bust	Back Length	Collar	Sleeve Length	Short Sleeve Length		
MIL-S-29368D	Marine	Shirts, Short and Long Sleeve	Half Bust	Back Length	Collar	Sleeve Length	Short Sleeve Length		
MIL-S-29628(NU)	Navy	Coat, Blue Dress	Bust	Back Length	Sleeve Inseam	Waist	Sweep		
MIL-C-44379(GL)	Army	Coat, Polyester/Wool, Classic Design	Half Bust	Back Length	Sleeve Length	Half Waist	Half Sweep	Cross Back	
MIL-C-31005	Air Force	Coat, Women's Polyester/Wool Serge	Half Chest	Back Length	Sleeve Length	Half Hip			
MIL-C-29453B	Marine	Coat, Polyester/Wool, Gabardine Blue	Half Bust	Back Length	Sleeve Length				.

4.0 RECRUIT DEPOT FEMALE FIRST FIT

Visits to view the female fit process for first issue of dress clothing were planned at each of the following bases:

Marine Corp	Parris Island, SC
Army	Fort Jackson, SC
Navy	Great Lakes, IL
Air Force	Lackland San Antonio, TX

Ring and Safar completed the planned visits over a period of several months based on schedules provided by each base staff representative. Each base issue area had a different layout as well as process of issuing. The Marine and Army female issue areas were limited to female personnel. The Navy and Air Force process was set up so that male personnel were allowed in the issue area because females were never in less than T-shirt and shorts. Changing clothing items was done in a closed off area if necessary. The following chart shows a comparison of the clothing items worn during the issue process by the recruit, the measurements taken, and the alterations requested.

All the alteration sewing area was located on their respective bases. Clothing items were transferred to this area sometimes by cart and other times by a slide transfer system. The business function of the alteration sewing area was sometimes handled internally and other times by an outside contractor. The process of issuing dress clothing, marking alterations, and reviewing the final garment was accomplished in a combination of processes all resulting in the recruit being provided with the best fit uniform possible from the stock tariff range with the allowed alterations.

	Clothing Items Worn During Fit Process	Measurements Taken	Alterations
Marine	Panty, Bra, T-shirt	None	Many at first issue. Especially on shirt and coat.
Army	Panty, Bra	neck, bust, waist, hips, cross back, center back length, sleeve length	Small quantity at waist on trouser and skirt. Several on coat especially at center back.
Navy	Panty, Bra, T-shirt, PT Short	bust, waist, hip, sleeve length, neck	Very few at issue except in special cases.
Air Force	Panty, Bra, T-shirt	None	Very few at issue except in special cases.
NOTE: Alterations information only refers to those made in addition to the hemming of the skirt, trouser, and coat.			

The following table indicates the tariff sizes available by service and item.

MARINE COAT	3 Back Lengths	0	2	4	6	8	10	12	14	16	18
Short, Regular, Long	3 Sleeve Lengths										
MARINE SHIRT	3 Back Lengths	0	2	4	6	8	10	12	14	16	18
Short, Regular, Long	3 Sleeve Lengths										
MARINE SKIRT	3 Lengths	0	2	4	6	8	10	12	14	16	18
Short, Regular, Long											
MARINE SLACK	3 Lengths	0	2	4	6	8	10	12	14	16	18
Short, Regular, Long											
ARMY COAT	Regular Size	2	4	6	8	10	12	14	16	18	20
5 Lengths Sleeve/Back	Plus Size	2	4	6	8	10	12	14	16	18	20
X-S, S, R, L, X-L											
ARMY SHIRT	5 sleeve length	4	6	8	10	12	14	16	18	20	22
P, R, L, XL, XXL											
ARMY SKIRT	Junior										
3 Lengths	Misses	4	6	8	10	12	14	16	18	20	22
Petite, Regular, Tall	Women's										
ARMY SLACK	Junior										
3 Lengths	Misses	4	6	8	10	12	14	16	18	20	22
Petite, Regular, Tall	Women's										
NAVY COAT	Junior	4	6	8	10	12	14	16	18	20	22
3 Lengths Sleeve/Back	Misses	4	6	8	10	12	14	16	18	20	22
Petite, Regular, Tall	Women's	4	6	8	10	12	14	16	18	20	22
NAVY SHIRT	Bust Size										
5 Neck Size per Bust Size	4 Sleeve Length										
NAVY SKIRT	Junior										
3 Lengths	Misses	4	6	8	10	12	14	16	18	20	22
Petite, Regular, Tall	Women's										
NAVY SLACK	Junior										
3 Lengths	Misses	4	6	8	10	12	14	16	18	20	22
Petite, Regular, Tall	Women's										
AIR FORCE COAT	Misses	2	4	6	8	10	12	14	16	18	20
3 Lengths Sleeve/Back	Women's										
Short, Regular, Long											
AIR FORCE SHIRT	3 Sleeve Length	2	4	6	8	10	12	14	16	18	20
Short, Regular, Long											
AIR FORCE SKIRT	Misses	2	4	6	8	10	12	14	16	18	20
Short, Regular, Long	Women's	2	4	6	8	10	12	14	16	18	20
AIR FORCE SLACK	Misses	2	4	6	8	10	12	14	16	18	20
Short, Regular, Long	Women's	2	4	6	8	10	12	14	16	18	20

4.1 Marine Recruit Depot, Parris Island SC

Carol Ring met with Marine Corp staff in preparation for viewing the female dress clothing first fit for new recruits. The process was discussed and a tour of the fit area was provided. The alteration shop is located on the base. Ring visited the shop and spoke with the owner of the business. The female issue line was located in a temporary area at the time of the visit.

The fitting room was set up with several long tables where the items to be issued were located. When the recruits are brought in they are orally provided with instructions about the process and also are provided a chart of garments on the wall that indicates the order in which the garments will be issued for the fit process.

Selected staff was available to provide the first garment for try on by observing the recruit and estimating their size. The recruit puts the item on and lines up to be reviewed by the master fitter for acceptance or rejection of the first size try-on. If the garment is rejected, the fitter tells the recruit what size to ask for and sends her back to the prior issue line. If the garment is accepted, the recruit goes to the tailoring alterations staff for further review. The tailoring staff has the option to question the size the recruit is wearing when they come to them and may send them back to the master fitter a second time. If the tailoring staff accepts the try-on size, they mark it for alterations and the recruit is instructed to take the garment to the line where the garment is turned in to go to the alteration shop.

There was a line of eight chairs against a wall that were used by the tailoring staff as they reviewed the try-on garments. Most of the staff stayed seated during the "marking" of alterations. The traditional tailors marking chalk was not used, instead the staff used straight pins to pin the alteration amount in place.

These previous observations were made during the process of watching and discussing details with the master fitter during the fit process. They are only an overview and are not intended to document the process completely.

Dress Clothing Items

The total of thirteen dress clothing items are issued during the first fit and are listed in the following table. The fitter and tailor review each garment. During the fit day Ring observed approximately 50, therefore the fitter observed 50 recruits 6 times each for a total of 300 times if no items were rejected. During the process Ring observed a minimum of 15 rejects on the first try-on for the 50 dress coats. The process could probably be more streamlined if necessary. There are such a low number of female recruits that the day is not as rushed as it would be if large numbers were being fitted.

GARMENTS ISSUED AT FIRST FIT

LONG SLEEVE SHIRT	3
SHORT SLEEVE SHIRT	3
GREEN SKIRT	2
BLUE SKIRT	1
GREEN PANT	1
BLUE PANT	1
BLUE DRESS COAT	1
ALL WEATHER COAT	1
TOTAL DRESS GARMENTS ISSUED	13

The recruits are not required to wear any specific style of bra or panty. The only requirement is that they not wear a sports bra. They wear an issue t-shirt during the fit process of all garments.

The dress slacks are fitted by the hip and then the waist. It is easier to alter the waist than the seat of the slacks. In some cases, it was observed that the thigh was a factor in fitting and would require a larger garment that would need the seat and waist altered.

The dress skirts are fitted by the hip and then the waist. It is easier to alter the waist as in the slacks. The thighs again were observed to be an issue if they were larger than the hip and caused the skirt to draw below the hip line.

The dress coat priority is the bust and then the across shoulders. The shoulder seam is not to extend beyond the normal shoulder end. The waist and hip would be considered next. The concept is to fit large if necessary and decrease with alterations rather than to try to let the coat seams out.

The dress shirt measurements in order of priority are bust, hips, waist and then across shoulders. As in the coat, the shoulder seam is not to extend beyond the normal shoulder end. The shirt is a princess line style with six possible seams to be altered for shaping of the torso and bust. Almost all shirts were "pinned" for alteration on the princess lines in the front and many times in the back.

The issue process was being handled in a temporary location; therefore no layout documentation was collected.

4.2 Army Recruit Depot, Fort Jackson SC

During the month of April Ring and Safar completed a visit to Ft. Jackson. The visit was initially planned for female dress clothing fit but as time allowed the male process was also viewed. Safar generated the following report on these visits with input from Ring.

Ft. Jackson Visit 11 - 12 April 2001

We observed the Phase II (Class A, Dress) female clothing issue and the final fit and inspection for male and female dress clothing at Ft. Jackson. There is only one dress clothing issue at Ft. Jackson that occurs 5 weeks into the training schedule. If necessary, additional alterations can be performed individually, by appointment, immediately prior to graduation. Because Ft. Jackson has in-house alteration capability, the issue, alterations, final fit and inspection take place in the same day.

Typically the recruits come in at 7:00am and stay all day until the issue is complete. The time varies depending on the number of recruits to be issued. On April 11 there were 61 female and 160 male recruits in the issue. Of these numbers approximately 1/3 was Phase I with the remainder being Phase II. Since the male and female Phase II issues were simultaneous, there were two separate fitting staffs.

The male process was observed the second day. It is very similar to the female with one exception. The trousers are fitted in a closed off area prior to the entering the fit line for the balance of the garments. The measurements are taken and trousers fitted by a male fitter then the recruits enter a straight-line issue area where male and female fitters are used.

Female Issue

Each female recruit is given a clipboard with a clothing issue sheet. The recruits are instructed to remove all clothing except bra and panties and to put on panty hose or knee high hose. The recruits wear non-standard underwear. The only requirement is that they wear a regular bra as opposed to a sports bra. The issue begins with foot measurement and dress shoe issue. Once the recruits are issued their shoes, they are instructed to leave them on throughout the issue process. (Note: This seems to be an excellent way of insuring that the shoes are properly fitted. Since the recruits wear them continuously for 6-7 hours they have every opportunity to see if there are any problems.)

The clothing issue begins with a fitter instructing two recruits on how to take measurements. The following measurements are taken: neck, bust, waist, hip, cross back, center back, and sleeve length. The two recruits proceed to take and record these measurements from each successive recruit. The measurements are recorded on the issue sheet each recruit carries. Our observation was that the fitter who demonstrated measurements for the recruits gave minimal instructions, and that the recruits proceeded to take somewhat random measurements that more or less approximated those instructions. We noted that the fitter's relied very little on these

measurements when doing preliminary garment selection for a recruit therefore based the size on their experience at fitting.

The recruit doing the measurement then instructed the measured recruits to proceed to a fitting station. While we were there the first station was slacks. When a line had formed there, the measurer started sending recruits to the shirt station, and finally the skirt station. After that recruits were directed to the shortest of the three lines.

Slacks station: Recruits received a pair of gloves and were fitted for slacks. The initial size selection appeared to be purely based on observation. Slacks were checked for waist and hip fit and measured and marked for hem length. A recruit was cycled through this process until the fitter was satisfied. Then the fitter filled out the alteration tags and the recruit was then directed to either the shirt or the skirt station. Some alterations were noted to slacks.

Skirt station: This issue was similar to the slacks station. Without referring to the measurements, the fitter issued skirts, which the recruits tried on. The skirts were checked for hip and waist and then marked for hemming. Some alterations to the side seams were observed.

Shirt station: At this station the recruit was issued 2 short and one long sleeved shirt. The long sleeve shirt was first issued, tried on, and reissued if necessary. Then the short sleeve shirt was issued and tried on. At this time the recruit also received the tie. Still wearing the short sleeve shirt and tie, but no skirt or slacks, the recruit then moved to the dress coat station. No alterations were observed on shirts.

Dress coat station: There were two fitters at the dress coat station. A number of alterations were noted here including moving the front buttons and alterations to the upper back. Coats were both hemmed and unhemmed. Unhemmed coats were marked for sleeve length. Virtually all hemmed coats had to be altered. It was later explained to us that Ft. Jackson has requested all unhemmed coats. The time to hem

all coats is less than the time it takes to rip out seams and alter sleeves on finished coats. From the dress coat station the recruit passed to the black coat station wearing the short-sleeved shirt and the dress coat, but no skirt or slacks.

Black coat station: The recruit was issued one black all weather coat over the dress coat. No alterations to the coat were observed. Once this fitting was complete, the recruit put the all weather coat in her duffel bag. The dress coat was sent for alteration. At this point the recruit was either done or needed to be fitted for the slacks and/or skirt and proceeded to the appropriate station.

Note: Some of the recruits were fitted for skirts and slacks wearing a shirt. Some were fitted not wearing a shirt. No recruit was fitted for the dress coat without a shirt. No recruit was fitted with the black coat without a dress coat and shirt. No recruit was fitted for the dress coat with a skirt or slacks.

Once complete, the recruits reassembled and were taken through an item-by-item check of their issue. As the alterations were complete - first the skirts and slacks and later the dress coats - the recruits began to dress for final fit and inspection.

Final Fit and Inspection

At Ft. Jackson, final fit and inspection consists of each recruit trying on every clothing item issued for inspection by the Drill Instructor (DI) under the supervision of the fitter. The fitter gave a briefing to the DI's on how each garment should fit and what they should check for. The session we reviewed included both recruits and National Guard personnel.

Female recruits have four separate inspections made up of combinations of:

- Skirt 1 and shirt
- Skirt 2, black coat, dress coat, long sleeve shirt
- Slacks 1 and shirt
- Slacks 2 and shirt

The male recruits had two inspections:

Black coat, dress coat, long sleeve shirt, trouser 1
Trouser 2 and shirt

The process: The DI's sat behind a table overlooking a platform. One DI was responsible for the paperwork. The women started cycling through their inspections before the men, but eventually both men and women were being inspected simultaneously. Initially, all of the women appeared in shirts and skirts/slacks only since the dress coat alterations took the longest. The DI's inspected each recruit and checked the individual clothing items for fit as instructed by the fitter. When there was a question about the fit, the fitter was consulted. As each inspection was complete the recruit was instructed to return and change into the next set of clothing items. When the dress coat passed inspection, the National Guard personnel proceeded to the insignia station, located in the Inspection area, for the selection of insignias for the dress coat.

Alterations & exchanges - All alterations were made by the fitter. All exchanges had to be approved by the fitter. In all, there were perhaps 5 exchanges and 5 alterations among the women. This was out of a total of approximately 500 clothing items issued to the women.

Observations: While it was obvious that the DI's did not particularly enjoy the tedious process of fit inspection, most made a real effort to make sure each recruit was properly fitted. Early in the inspection process, the DI's inspected each recruit carefully; however it was clear that they were not knowledgeable about the concept of fit as outlined by the fitter. As the number of recruits increased, the inspections became more perfunctory.

As stated before, each female recruit was supposed to have four inspections to insure that each item had been reviewed. As the number of recruits in the inspection room increased, so did the confusion. Some recruits probably did not complete all of the required inspections. The process had some obvious flaws and bottlenecks; however, by the end of the day each recruit was probably as well fitted as his or her body type allowed. This was due partly to the availability of immediate alteration, partly to the

design of the Army dress uniform, and partly to the wide range of sizes available for most Army dress clothing items.

4.3 Navy Recruit Depot, Great Lakes IL

During the month of April Ring and Safar completed a visit to Great Lakes. The visit was initially planned for female dress clothing fit but as time allowed the male process was also viewed. Safar generated the following report on these visits with input from Ring.

Great Lakes Recruit Training Command 25-26 April 2001

The Great Lakes Recruit Training Command (GLRTC) processes over 50,000 recruits per year. Of these, approximately 18% are female. Depending on the time of year, the recruits will graduate in either the service dress white or service dress blue uniform. When the recruits first come in, they are issued basic items such as underwear, athletic shoes and sweats. Basic training lasts 8 weeks. First clothing issue is in week 1, day 2 (1-2) and consists of boots and utility clothes. Second clothing issue is approximately week 4, day 2 (4-2) and consists of dress shoes and dress clothing. Clothing issue typically lasts 4 hours. The facility can handle up to 8 issues per day:

2 Female First - 2 Male First - 2 Female Second - 2 Male Second

The clothing facility operates 6 days a week. Personnel consist of issue line staff, issue facilitators, and fitters. On the days we observed, the issue line staff were both male and female, all of the facilitators were male, and all of the fitters were female. Because the staff is mixed, the recruits wear PT shorts and T- shirts even while being measured and fitted. The processes for first and second issue and male and female issue are virtually identical, the only differences being the types and numbers of clothing items issued. Alterations are limited to length, sleeve, trouser and skirt hemming and are done at a sewing facility located in the clothing issue building. Occasionally a waist will be altered when the recruit is extremely large or small in the hip or waist. Special measurement items are handled by faxing the EOF form to DSCP.

We observed parts of all four issues - Male 1st and 2nd and Female 1st and 2nd over a period of two days.

FACILITY

The clothing issue facility at great lakes is composed of two floors, identically configured, for male and female issue. The first floor is for male issue and the second floor is for female issue. Each floor consists of two adjacent rooms for first and second issue respectively. Each room has the same arrangement of bays, fitting stations and platforms. The issue lines are directly behind these double rooms.

The square footage for male and female issue is identical, although there are 4 times as many male recruits as female recruits. During the summer surge, an overflow of male recruits can be handled on the second floor.

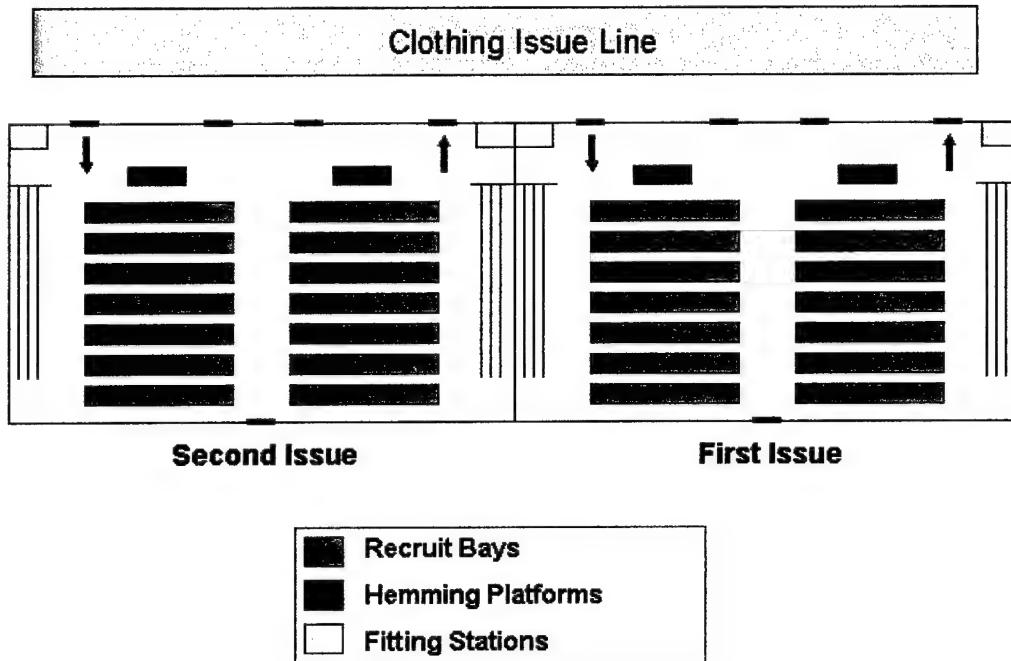
Bays - There are 14 bays in each Issue Room, 7 per side, with stations for 14 recruits in each bay. Room capacity is 196. At each station is a bin which is preloaded with non fitted items such as belts, socks, etc. Measurement occurs at the end of each bay.

Measurement Platform - In front of each set of bays is a measurement platform which is used for shoe measurement, and trouser and skirt hem marking.

Fitting Station - There are two fitting stations per issue room. As the recruits try on clothing items, they line up in rows of three before the fitting station. Up to three fitters will work from each station.

Issue Line - The issue line is located behind the issue areas and runs continuously behind the adjacent 1st and 2nd issue rooms. The line includes a roller conveyor for the recruit bins with clothing in boxes behind the conveyor. At any given time the issue line will only be staffed for the ongoing issue.

Great Lakes Recruit Training Command Clothing Facility



CLOTHING ISSUE

First Issue

In addition to utility items and underwear the clothing items at first issue are the same for both male and female and consist of:

- 1 Safety Shoe
- 1 Utility Jacket
- 1 Raincoat
- 4 Working Shirt
- 4 Working Trouser

Second Issue, Male

General

- 1 Dress Shoe
- 3 White Hat
- 1 Peacoat
- 1 Coverall

Service Dress White Uniform

- 2 Jumper

2 Trousers

Service Dress Blue Uniform

1 Jumper

1 Trouser

Winter Blue Uniform

2 Shirt

2 Trouser

Summer White Uniform

2 Shirt

2 Trouser

Second Issue, Female

General

1 Hat

1 Dress Shoe

1 Peacoat

1 Coverall

Service Dress White Uniform

2 Jumper

2 Slacks

2 Skirt

Service Dress Blue Uniform

1 Coat

1 Slacks

1 Skirt

Winter Blue Uniform

2 Shirt

2 Slacks

Summer White Uniform

3 Shirt (also worn with Dress Blue Uniform)

2 Skirt

2 Slacks

All of these items are described and pictured in *United States Navy Uniform*

Regulations, Department of Navy, NAVPERS 156651. Available on the ARN web site

at <http://arn.iitri.org/temp/navyreg.pdf>

PERSONNEL

Facilitators - The facilitator's responsibility is to oversee the issue process, explain what is expected of the recruits, and generally keep the process moving smoothly. The length of each issue session was to some extent dependent on the availability of personnel to perform certain functions. The facilitators were responsible for scheduling

the fitters and issue line personnel and also scheduling specific events such as the RDC hat inspection and shoe exchange.

Fitters - Only female fitters were observed the two days we were there. All fitters are trained to handle both issues, male and female. There are 9 full time fitters who move from issue to issue as needed. We did not get into the details about how fitters time is allocated, but did note that when multiple issues were ongoing, fewer fitters were available per issue and issue time increased.

Issue Line Staff - The issue line staff appeared to be cross-trained on both male and female first and second issue items. We noted at least one delay in female second issue when there was no issue line staff available to issue dress shoes.

Recruit Division Chiefs (RDCs) - The RDCs were usually present throughout the issue with significant differences noted in their roles between first and second issue. During first issue the RDC used any waiting time (i.e., shoe measurement) as training time - quizzing the recruits on regulations and maintaining order. The second issue is much more complex and the facilitators were primarily in control of this issue. The RDCs primary role was to keep the recruits quiet and orderly and to oversee the hat fit.

PROCESS

Sessions normally run from 6:30 to 11:00 and from 11:30 until 4:00 depending on the size of the Divisions and the type of issue. Male and Female First issue is usually much shorter than second issue, the bulk of the time is spent on measuring for and fitting the boot. Female second issue typically takes longer than male issue because the females receive 5 skirts and a dress coat in addition to the items received by males. However, female issues typically involve fewer numbers, so they tend to finish at about the same time.

While full division issue is going on, any number of unscheduled exchanges occurs when individual recruit or groups of recruits came in to exchange clothing that did not fit

or was damaged. Recruits are not charged for exchanges due to size changes, but are charged for damage or loss, depending on the circumstances.

Male and Female First Issue

Because the process is virtually identical for males and females, both will be described here. Recruits enter through the main door and are directed into the bays. They remove their sweatpants remaining in PT shorts, T- shirts and athletic shoes. Each station in the bay has a bin preloaded with non-sized items such as belts and socks. The recruits have been given an issue sheet that has measurements and sizes on one side and a listing of the issue items on the other side. This sheet is used for both first and second issue. The recruits fill out these sheets, then line up for safety shoe issue. They form a single line around the perimeter of the room wearing athletic shoes. When they reach the platform they remove the right shoe and hand the fitter their issue sheet. The fitter measures the right foot and marks the size on the sheet. The recruits put the shoe back on, and return to the bay. At no time are recruits allowed to walk around without shoes on. The recruits then proceed to the issue line for safety shoes. The shoes are worn for the balance of the issue and exchanged if needed. Once safety shoe issue is complete, the facilitator calls the clothing fitters. They go to the end of each bay to measure each recruit. The fitters issue form for males includes the following measurements: Neck, Waist, Sleeve, Inseam, and Shoulder. The female form includes: Neck, Waist, Sleeve, Inseam, Shoulder, Hip, Bust, and Head. The recruit is asked for his or her underwear size. The fitters mark the size of the items to be issued. Once the measurement is complete, the recruits take their bins and proceed to the issue line with their issue sheet fastened to the front of their T- shirt. The issue line staff read from the issue sheet and deposit the required items in the bin. Items are issued in reverse order of what is to be tried on so that the first item tried is on the top of the bin. The clothing items are tried on and checked for fit. Exchanges are made as needed and any alterations to the working trouser hem are marked. Nametapes are issued and inserted in the pockets of the clothing items. Clothing items are sent to Tailoring & Alterations for nametape sewing and alterations.

Second Issue, Female

Recruits enter through the main door and are directed into the bays. They are directed to remove the uniform of the day down to their PT shorts and T- shirts. The females have been directed not to wear sports bras for this fitting. The issue sheets from the first issue have been laid out in a separate bay. The recruits are directed to pick up their issue sheets. The dress shoe is issued from the boot size measurement taken at first issue. The recruits are then directed to the issue line for dress shoes. The dress shoes are tried on. The facilitator initially allows exchanges only if the shoe is too small for the recruit to fit her foot in. The balance of shoe exchanges are done near the end of the session. The recruits wear the dress shoe for the balance of the second issue. While the dress shoe fit is going on, the fitters begin taking measurements. Although some measurement has been done and recorded during first issue, additional measurements or re-measurements are taken at second issue. The fitters stand at the end of each bay, measure each recruit, and mark the sizes for second issue items. The fitters were obviously taking measurements, but it was not clear if they were using measurements from the first issue also. The process continues with the fitters moving from bay to bay until all measurements are complete. The recruits are then directed to take their bins and proceed down the clothing issue line. They wear their issue sheet on the front of the T- shirt so the issue line staff can read and issue the sizes marked. All items are issued in reverse try-on order so that the last item issued is the first to be tried on. The females are issued 23 clothing items that need to be checked for fit so keeping the items in the correct order cuts down on confusion.

Service Dress White Uniform

The recruits are directed to try on the dress white jumper and skirt. They carry the second jumper with them and line up in rows of three at the fitting station. The fitters check the jumpers and skirts for fit. If the fit is acceptable the fitter marks the jumper sleeve for hemming the recruit proceeds to a line near the platform and tries on the second jumper. The fit of this is checked and the sleeve length marked from the previously marked jumper. The recruit then proceeds to the platform where the skirt is marked for hemming. The recruit then returns to the bay, lays the skirt to one side and

tries on the dress white slack. The recruit proceeds to the fitting station where the slack is checked for fit and to the platform where the slack is marked for the hem. The recruit returns to the bay, checks to make sure that the second slack is the same size as the first and lays the slacks and jumper to one side. The recruit then proceeds to the next uniform.

If the fitter decides that the recruit needs an exchange, she issues the recruit an exchange ticket marked for the item(s) to be exchanged. The recruit returns to the bay, removes the item and returns it to the plastic bag it came in and returns to the issue line for a different size. The recruit then returns to the bay, tries on the exchanged item and returns to the fitting station for another inspection. The recruit continues the process of inspection, exchange and hem marking until all items are complete.

Winter Blue Uniform

Those recruits who completed the fit and marking of the summer dress white uniform were directed to put on the blue shirt and blue slack and proceed to the fitting station. They were fitted only after recruits who were exchanging summer dress white uniform items. The shirt and pants were checked for fit and if acceptable the recruit was directed to the platform to have the slack hem marked. Once the slack was marked the recruit was directed to return to the bay, check to be sure that the size of the second shirt and slack were the same and put them aside. The recruit then proceeded to the next uniform. Exchanges were handled as with the summer dress white uniform.

Service Dress Blue Uniform

Those recruits who completed the fit and marking of the winter blue uniform were directed to proceed to trying on the winter dress blue uniform starting with the summer white shirt and blue skirt. They were instructed to carry the dress coat. They again lined up at the fitting station, but were fitted only after any remaining recruits exchanging summer dress white items or winter blue items. Once the fitter made the determination that the shirt and skirt fit, the recruit then tried on the dress coat. If that fit was passed, the recruit passed to the platform for hem marking. Once complete the recruit returned

to the bay for the hat and proceeded to have the RDC check the hat size. Once the hat fitting was complete the recruit returned to the bay, removed the skirt and jacket, laid them aside and returned the hat to its box. The recruit then put on the dress slack and returned to the fitting station. If the fit was acceptable, the recruit proceeded to the platform to have the hem marked. The recruit then returned to the bay, removed the slack and laid it aside. Exchanges were handled as with previous uniforms. The pea coat was tried on over the dress blue uniform.

Summer White Uniform

Those recruits who completed the fit and marking of the service dress blue uniform were directed to put on the summer white skirt and proceed to the fitting station carrying the second skirt. The skirt fit was checked and if acceptable, the recruit proceeded to a second line and changed into the second skirt. If that fit was acceptable the recruit proceeded to the platform to have the hem marked. Once complete, the recruit returned to the bay, laid aside the two skirts, put on the summer slack, and proceeded to the fitting station. After fit check and hem marking, the recruit returned to the bay, checked the size of the second white slack and laid both aside.

Coverall

Once the recruit had completed fit and marking of all of the uniforms, she was directed to try on the coverall and proceed to the fit station. The coverall was checked for fit and reissued or marked (if necessary). The recruit then returned to the bay and proceeded to put on the uniform of the day.

Finish

At some time during the fitting process the dress shoes were exchanged as needed. This exchange varied with each issue we observed. All items requiring alteration were bundled and loaded into carts for delivery to the sewing operators. Remaining items were placed in the recruit's seabag.

ALTERATIONS AND SPECIAL MEASUREMENT

According to the staff there is virtually no tailoring done and the only alterations are to hem and sleeve length. The assumption is that there is a stock size that will fit. During week 6 the recruits are inspected and checked for fit again. At this time any items deemed not to fit are exchanged for new items that are then hemmed. Special measurement items occur occasionally and are handled using the EOF special measurement form, which is faxed directly to DSCP for expedited handling.

MEASUREMENTS COMMENTS

Females were measured around the bust in the standard fashion for issuing coats, which are offered in juniors, misses, and women's. This size tariff allows for a change of 2 inches in hip measurement from junior to misses to women's. Therefore covers a larger hip to bust change. It is also offered in three lengths petite, regular, and tall.

Males were measured around the shoulders instead of the traditional chest measurement. This was the measurement used to issue the jumpers. The jumpers are sized as traditional coats ranging from 30 through 52. We must assume that the fitters were trained to relate the overarm to the coat size.

Trousers were issued by waist size. The hip was not included in the measurements taken for the male. The trousers fit much more like a casual pant than a dress pant. They fit the hip snug with ease at the waist. This style is a little easier to fit, as the seat of the pant is not as loose as the dress trouser. Therefore differences between waist and hip were not as visual as in some garments. The waist was described as about 1" above the hipbone.

The sleeve measurements were taken from the center back of the neck across the shoulder and down to the wrist, as are the ARN measurements. This is the traditional method for this measurement.

The measurements observed at the issue of the dress clothing were sometimes documented on the issue sheet and sometimes not. It seemed to depend on the fitter. The recruits were sometimes asked if he or she had gained or lost weight during the previous weeks.

4.4 Air Force Recruit Depot, Lackland San Antonio TX

During the month of May, Ring and Safar completed a visit to Lackland Air Force base to review the female fit process. The visit was initially planned for female dress clothing fit but as time allowed the male process was also viewed. Safar generated the following report on these visits with input from Ring.

Lackland Air Force Base Recruit Clothing Issue 22-23 May 2001

Lackland AFB processes approximately 34,000 recruits annually. Less than 20% are women. Recruits are divided into flights, each flight consisting of between 30-60 recruits. There are two clothing issues for recruits: first issue includes underwear, boots, BDUs and sweats; second issue includes dress shirts, trousers, skirts, and coat along with the all weather coat, dress shoes and flight jacket. The clothing facility is divided into male and female areas. First and second issue areas are differently configured (see below). Most of the issue process is open. All recruits in the open areas wear a minimum of T-shirts and BDU pants. Both the male and female issue areas have closed-off changing rooms for changing into trousers and skirts. According to the staff, first and second issue can be done simultaneously. Observations indicated that the maximum number of female flights that could be handled in a day was two - 1 first and 1 second or 2 seconds. The male facility handled three flights of second issue while we were present. According to staff, an average off surge schedule was approximately 6 female flights per week and 14 male flights per week in both first and second issue. We observed male and female dress clothing issue.

FACILITY

Clothing issue at Lackland is in a separate building. While somewhat different in configuration, the male and female issues are set up similarly. Both areas are divided into first and second issue. There is no separate clothing line for either first or second issue. All clothing items and shoes are in boxes on shelves lining the walls or hanging on racks. See diagrams below (not to scale).

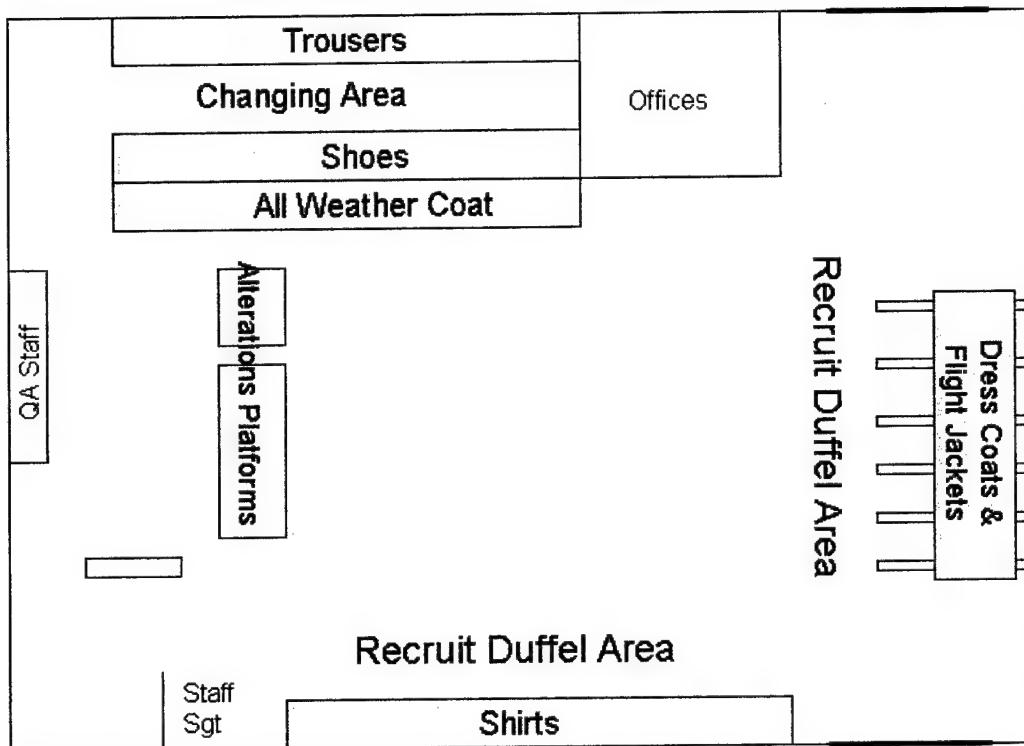
First Issue

The first issue areas are divided into two sections. One section includes bays where the recruits receive accessory items and open areas for inspection. The second section is a closed area for changing. The male first issue area has 120 bays; the female first issue has 50 bays.

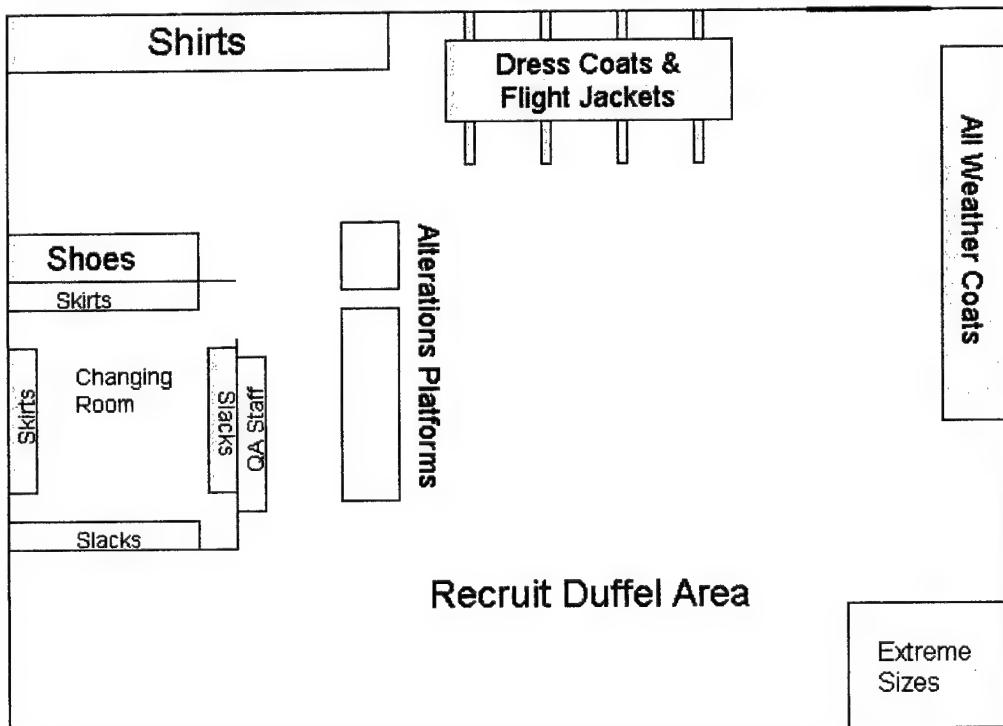
Second Issue

The Male Second Issue area is about twice as large as the Female Second Issue Area. The male area can handle up to three flights simultaneously. The female area can handle two flights, but only by using the first issue area for part of the process. The open area has clothing in boxes on shelves against the walls. There is also an area for the racks of dress coats and flight jackets. On the female side, the dressing room also contains the dress skirts and slacks. The open areas have platforms for inspection and alterations. As they come in, the flights are directed to sit in groups around the outside, leaving the central area open.

Male Second Issue - Lackland AFB



Female Second Issue – Lackland AFB



CLOTHING ISSUE

We did not observe first issue and did not get the exact numbers and items of clothing issues. Judging by the items available in the first issue areas the issue items included:

Male & Female First Issue

Boots
BDUs
Sweats
Socks
Towels
Brown T-shirts
Belt

Female Second Issue

2 Skirts
2 Slacks
3 Long Sleeve Shirts
3 Short Sleeve Shirts
1 Coat
1 All Weather Coat
1 Flight Jacket
1 Pr Dress Shoes
1 Hat, Belt and Buckle, Purse, Neck Tabs

Male Second Issue

4 Trousers
3 Long Sleeve Shirts
3 Short Sleeve Shirts
1 Coat
1 All Weather Coat
1 Flight Jacket
1 Pr. Dress Shoes
1 Flight Cap, Belt & Buckle, Necktie

PERSONNEL

A contractor did virtually all of the second issue. Air Force personnel consisted primarily of Quality Assurance personnel. The observed contractor staff was different for male and female fit. There were Air Force Staff Sergeants who handled the initial dress shoe issue and peripherals issue as well as First Issue.

Contractor Staff

Contractor Supervisor - also did male fitting

Male Fitters - 3 male fitters and supervisor

Female Fitters - 3 female fitters

The contractor staff operates under a well-defined schedule. The fitters work from 7am-12pm and from 1-4pm. All alterations are supposed to be complete no later than 4:30. On the day we observed the female second issue it was clear that the issue would last well beyond 5:30 because of the number of re-alterations that had to be done.

Air Force Staff

Director - Second Lieutenant Keith Higginbotham

Female Issue Supervisor - MsSgt Avis Webster

Male Issue Supervisor - MsSgt Ronnie Barney

Staff Sergeants Male and Female - Presumably they handled most of the First Issue.

Their responsibilities during Second Issue were issue of dress shoes and ordering inventory from the warehouse for out of stock items.

Quality Control Supervisor - Annie Hickman - Did both male and female validation, depending on the load with one assistant

Quality Control Staff - 1 male, 1 female - Validation of fit of dress coat and all weather coat prior to alteration. Validation of all items after alteration. Pre-approval of all alterations other than hems to trousers, slacks, skirts and coat sleeves.

PROCESS

First issue takes only half a day. Second issue takes a full day. For second issue, all alterations are done on site and the recruit leaves with a complete dress uniform. The issue process varies depending on how many recruits there are to be processed. The following is the description of the process as was observed for one female Flight and one male Flight.

All clothing items are self-issued by the recruits. They are given a size and directed to go to the area of the issue room where this item is stored. They are responsible for taking the item(s) out of the storage boxes and proceeding to try on. Exchanges are not tracked.

Storage in both male and female issue rooms is limited to one box per size for shirts, skirts and trousers. Dress coats and flight jackets are on racks with a box number available for each size. A number of sizes ran out during the issues we observed and additional boxes had to be requisitioned from the adjoining warehouse. This was done by the Staff Sergeants and typically took at least an hour. Recruits needing these sizes had to wait for the boxes to be delivered before they could be fitted and marked for alteration. All of the initial clothing issue was complete before lunchtime so that all stockouts were identified early in the process.

Female Second Issue

At 6:30am the females arrive dressed in BDUs. They are directed by an Air Force Sergeant to sit down in rows along one wall with their duffel bags. They remove their boots, put on dress socks, and proceed with dress shoe issue and issue of belts, hats, purse and neck tab. Dress shoes are self issued, no measurement is done. When this is complete, they return to their duffel bags and place their items inside. They continue to wear the dress shoes throughout the issue process. All clothing is tried on with the females wearing bra, T-shirt and panties. While the females are changing into skirts or slacks they are in a closed dressing room.

Dress Skirt and Slack

At 7:00am the contractor fitters arrive and begin with the skirt issue. The females stand in lines while a fitter determines their size by visual inspection only. No measurements are taken. Once they have a size, the females proceed to the dressing room and select and try on a skirt. With the skirt on they line up at the fitting platform where the fitter assesses the fit and either marks the skirt for hemming or directs the recruit to exchange it. Each recruit does this process twice, once for each skirt. Of 90 recruits,

we observed 123 exchanges. The process for the dress slack is the same as for the skirt. The contractor fitters do all sizing and marking. Any alterations other than hemming need to be pre-approved by the Air Force Quality Control staff. We observed a number of instances where the skirt or slack button was moved. Rarely the waist was altered. No other alterations were observed. All hem marking was done visually. Skirts were visually marked at two or three different places. We observed that this often resulted in uneven hems. Slack leg hems were marked separately, and we observed that this often resulted in a difference in length between the legs. We also observed that the fitters seldom attempted to place the skirt or trouser in the correct "wear" position on the recruit prior to marking. The recruits return to the dressing room, issue themselves a "loaner" pair of slacks in the same size as the marked slack and return the skirts and slacks for alteration. They proceed to dress shirt issue.

Shirt

The dress shirts are issued by visual inspection. The process is similar to that of the skirt and slack; however, no alterations were observed. The females cycle through the fitter's inspection until the fitters are satisfied with the fit.

Dress Coat & All Weather Coat

The dress coat is issued 1 or two sizes larger than the shirt size and tried on over the shirt and slack. After the coat is fitted and marked for sleeve length, the Quality Assurance staff validates the fit. We observed a number of exchanges. The all weather coat is issued the same size as the dress coat and is tried on over it.

Flight Jacket

Once all marked clothing has been sent to alterations, the recruit is fitted for a flight jacket. Once this is complete, the recruits change back into BDUs and wait for alterations to be complete.

Second Issue Final Validation

At some time after 1:00pm the altered clothing is returned and tried on by the recruits. Typically, the trousers and skirts are completed first, followed by the dress coats and all weather coats. Validation (acceptance) of the uniform is performed by the Lackland Quality Assurance staff. Clothing items that are not considered a proper fit are remarked and returned for additional alterations. This process cycles through until all of the recruits have a complete dress uniform passed by a Lackland Quality Assurance staff member. During this process we observed the re-alteration rate at between 70-80% for trousers and skirts.

Male Second Issue

The male second issue process is similar to the female process, but with fewer items because the males are not issued skirts. Hats, belts, and dress shoes are issued under the supervision of a Lackland Staff Sergeant. The fitters arrive at 7:00am and begin issuing shirts. Preliminary sizing was done visually and items were exchanged until the correct fit was achieved. The same sizing was done for trousers. The dress coat and flight jacket are issued based on the waist size (trouser size) plus 7 (drop). The all weather coat is issued 2 or 3 inches larger than the dress coat (the all weather coat is even sizes only while the dress coat is by chest), i.e., a 34 dress coat would get a 36 all weather coat, a 35 dress coat would be issued a 38 all weather coat.

Alteration and Validation

The alteration and validation process was essentially the same for male clothing items with the following exception:

During the alteration process for trousers the fitter took the inseam measurement and both trouser legs were marked accordingly. It was also observed that the fitters placed the trousers in the correct "wear" position before taking the inseam measurement. This resulted in far fewer re-alterations for male trousers than for female slacks and skirts.

EXCHANGES

As noted above, initial shirt and trouser/slack/skirt sizing was done visually and items exchanged until the fitter determined that the fit was accurate. Exchanges are not tracked. We observed:

Female Dress Skirt First Issue

Number of recruits: 90

Skirts exchanged: 123

Percent: 136%

Once the fitters were satisfied with the dress coat and all weather coat fit, the items were marked then validated by Lackland Quality Assurance staff:

Dress Coat and All Weather Coat Initial Validation

Number of recruits: 90

Dress Coats exchanged: 22

Percent: 24%

All Weather Coats exchanged: 10

Percent: 11%

ALTERATIONS AND VALIDATION

The skirt, slack, trouser and dress coat sleeve are all un-hemmed and require marking

and hemming. The all weather coat is hemmed, but occasionally requires re-hemming.

The fitters are responsible for fit and marking of all skirts, slacks and trousers. No validation is required unless an additional alteration (other than hem) is recommended.

All dress coats and all weather coats are validated before the size and/or alteration markings are accepted.

After the first alteration, all clothing items are validated for fit by the Lackland Quality Assurance staff. On the female side we observed that between 70-80% of all slacks

and skirts were returned for re-marking and re-hemming. The two observed reasons for return were: 1) Uneven skirt length, uneven slack length; 2) Incorrect length. The *uneven* lengths were due to the observed process of marking the slack legs separately and visually marking the skirts at two or three different locations. The *incorrect* lengths were primarily due to the fact that the fitters seldom placed the garments at the correct "wear" position, while the Quality Assurance staff always did. We observed that the percentage of re-hemming for the male trouser was considerably less than for female slacks. We asked the Quality Control staff why the female fitters did not use the same process on the slack as the male fitters did on the trouser. We were informed that the contractor was training the female fitters on that process, but was running into resistance. When we asked why a standard measurement/marketing device was not used for the skirt (as it is at both the Army and Navy), we were informed that this equipment was available to the contractor staff, but that they chose not to use it.

Note: The contractor is paid only once for an alteration, no matter how many times it has to be redone.

FEMALE MEASUREMENT AND FITTING

As mentioned the size selected for try-on was selected by the visual observation of the fitter, no measurements were ever taken. We observed that the fitters were reviewing the fit at the shoulders and bust for the coat and shirt. A small amount of ease, approximately $\frac{1}{2}$ ", was allowed on the shoulders of the coat and shirt. The shirt was to fit freely at the bust and waist and be long enough to tuck in. In most cases the garments fit was loose which the style of the garment allowed. The design of the dress coat was also very relaxed. The chest was fitted with 3-5 inches of ease and fit very loosely.

The fitter tested the skirt waist ease as she ran her fingers inside the garment waist. The hip area generally provided 2 or more inches of ease. The goal appeared to be that the garment fit without any snugness at the hip or thigh. In some cases the recruit thought the garment was too large in which case the fitter suggested that this was the

look for the military and not the one that they were accustomed too. In many cases the fitters did ask the recruit how the garment fit felt to them and took this into consideration. The slacks were fit in a similar manner to the skirt with the fitter testing the waist fit with their fingers.

5.0 MARINE FEMALE SIZE SELECTION

Preliminary size selection rules were generated for the female Marine Corp recruit. Patterns, military standards, and samples were requested from staff at DSCP. The patterns were imported into the CAD system at SPSU. A select group of sizes were printed from the imported files and verified against a plotted copy provided by DSCP. After verification the seam allowance information was extracted from the MIL standards and was identified on the CAD pattern files. A small selection of finished garment measurements is provided in the MIL standard for quality control during manufacturing. This list does not provide the total number of measurements required for writing size selection rules. Therefore, the researcher checked and verified the measurements provided and extracted the additional measurements used for size selection.

The female dress garments are offered in a tariff of sizes X0 through 18. All garments reviewed are offered in lengths: short, regular, long. The lengths are based on height: short 5'4" and under, regular 5'4" to 5'8", long 5'9" to 6'. The following table provides a list of the Female Marine Corp dress items that were reviewed for preliminary size selection generation.

Service	MIL SPEC	ITEM
Marine Women's	MIL-S-29429B	Skirts, Women's
Marine Women's	MIL-S-29432B	Slacks, Women's
Marine Women's	MIL-C-29453B	Coat, Woman's: Poly/Wool: Blue
Marine Women's	MIL-C-29427B	Coat, Women's: Poly/Wool: Green
Marine Women's	MIL-S-29368D	Shirts, Women's: Long and Short Sleeve

5.1 *Marine Women's Skirt*

Preliminary size selection rules were generated for the female Marine Corp recruits. The female skirt and slack were the first two items to be completed. The MIL specification, patterns, and Marine Corp fit manual were utilized in determining the accepted alterations and a range for each. The following tables provide the measurements for the female Marine Corp dress uniform items: dress skirt and trouser.

The measurements for each of the sizes included in the size tariff were generated using the patterns by extracting the grading changes on each component. The appropriate growth was calculated for each component that caused change in a specific finished measurement.

Service	MIL SPEC	ITEM
Marine Women's	MIL-S-29429B	Skirts, Women's
Marine Women's	MIL-S-29432B	Slacks, Women's

MARINE FEMALE BODY MEASUREMENTS

MARINE - SIZE	XO	2	4	6	8	10	12	14	16	18
WAIST	22.50	23.50	24.50	25.50	27.00	28.50	30.00	32.00	34.00	36.00
HIP	33.00	34.00	35.00	36.00	37.50	39.00	40.50	42.50	44.50	46.50
THIGHS	32.50	33.50	34.50	35.50	37.00	38.50	40.00	42.00	44.00	46.00
THIGH	21.25	21.75	22.25	22.75	23.50	24.25	25.00	26.00	27.00	28.00

SKIRT EASE

MARINE - SIZE	XO	2	4	6	8	10	12	14	16	18
WAIST (garment)	22.50	23.50	24.50	25.50	27.00	28.50	30.00	32.00	34.00	36.00
ease	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HIP (garment)	34.50	35.50	36.50	37.50	39.00	40.50	42.00	44.00	46.00	48.00
ease	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
THIGHS (garment)	35.50	36.50	37.50	38.50	40.00	41.50	43.00	45.00	47.00	49.00
ease	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

PANT EASE

MARINE - SIZE	XO	2	4	6	8	10	12	14	16	18
WAIST (garment)	22.50	23.50	24.50	25.50	27.00	28.50	30.00	32.00	34.00	36.00
ease	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HIP (garment)	35.00	36.00	37.00	38.00	39.50	41.00	42.50	44.50	46.50	48.50
ease	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
THIGH (garment)	24.25	24.75	25.25	25.75	26.50	27.25	28.00	29.00	30.00	31.00
ease	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Skirt Size Selection Methodology

The measurements used for the size selection on the Marine Corp dress skirt item are the hip, waist, and thighs in order of importance in the fit process. The ease or difference between the body measurement and the garment-finished dimension were calculated for each measurement used in size selection. The range of acceptance on ease for the hip based on the preferred measurement extracted was determined and would require no alteration. The range for alteration allowed for the waist and the thighs were also determined in the same manner as the hip.

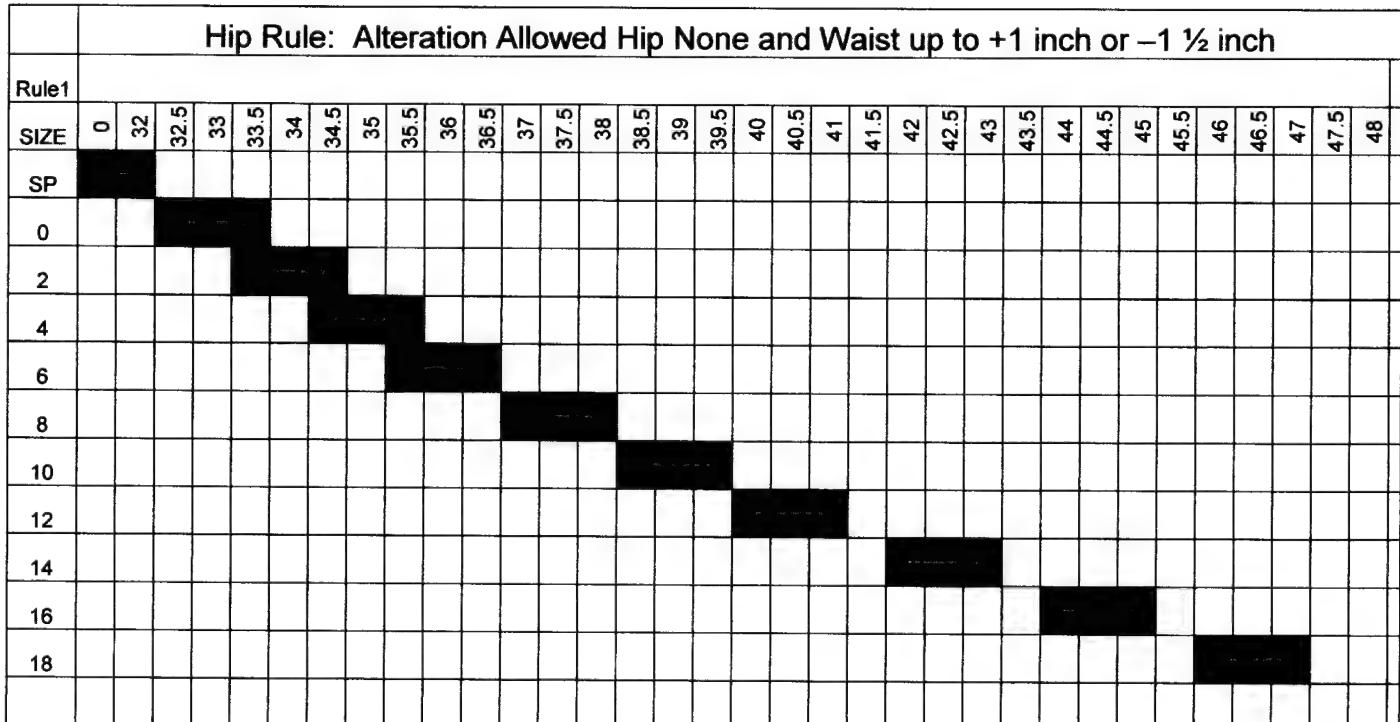
The following table indicates the methodology of rule generation for the size 8 garment. The first rule does not allow an alteration range for the hip and is the preferred rule. The waist and thighs allow up to the maximum alteration but may not be required if the measurement is close to the standard indicated.

The alterations allowed on the hip are a reduction of up to 2 inches and an increase of up to 2 inches. The seam allowances for the skirt, $\frac{3}{4}$ and 1 inch, were provided for alterations. The preferred alteration if necessary is to reduce rather than increase the garment measurement. Therefore, the order of rules is no alteration on the hip, reduce the garment at the hip, and increase the garment at the hip.

The alterations allowed on the waist are a reduction of $1\frac{1}{2}$ inches and an increase of up to 1 inch. The rules for the hip would also apply to the thighs measurement (around the thighs together) which is a reduction of up to 2 inches and an increase of up to 2 inches.

		Hip Ease Standard 1 1/2 inches				Waist Ease Standard 0 Ease				Thighs Ease Standard 3 inches							
		Size	Lower	Upper	Garment	Ease	Ease	Lower	Upper	Garment	Ease	Ease	Lower	Upper	Garment	Ease	Ease
No hip alteration		8	36.5	38	39	1	2.5	24.5	28	27	-1	2.5	34.5	38	40	2	5.5
Alter hip -2 alter waist +1 -1.5		8	34.5	38	39	1	4.5	24.5	28	27	-1	2.5	34.5	38	40	2	5.5
Alter hip +2 alter waist +1 -1.5		8	36.5	40	39	-1	2.5	24.5	28	27	-1	2.5	34.5	38	40	2	5.5
Alter hip +2-2 alter waist +1-1.5		8	34.5	40	39	-1	4.5	24.5	28	27	-1	2.5	34.5	38	40	2	5.5

The following tables display in a graphic the range of body measurement allowed on each size as you progress through the rules. The female slack rules were developed with the same methodology. The first hip rule does not have a range between each size that ends and begins at the next size end point. This is because female patterns have a grade change of 1 inch, 1 1/2 inch, and 2 inches as the size increases in the group of sizes. Therefore, if no alterations are allowed on the hip in rule 1, when the change happens from one increment of grade to the next the end points have a gap. This is compensated for in the following rules allowing alterations for this measurement set.



	Thighs Range Per Size Alteration Allowed Increase up to 2 inch > Decrease up to 2 inch																																		
SIZE	30	30.5	31	31.5	32	32.5	33	33.5	34	34.5	35	35.5	36	36.5	37	37.5	38	38.5	39	39.5	40	40.5	41	41.5	42	42.5	43	43.5	44	44.5	45	45.5	46	46.5	47
0																																			
2																																			
4																																			
6																																			
8																																			
10																																			
12																																			
14																																			
16																																			
18																																			

5.2 *Marine Women's Slack*

The calculation of the fit ease for the slack is included in the previous section along with the skirt information. The slack patterns were reviewed with the same methodology as the skirt.

The following table indicates the methodology of rule generation for the size 12 garment. The first rule does not allow an alteration range for the hip and is the preferred rule. The waist and thigh allow up to the maximum alteration but may not be required if the measurement is close to the standard indicated.

The alterations allowed on the hip are a reduction of up to 1 inch and an increase of up to 1 inch. The preferred alteration if necessary is to reduce rather than increase the garment measurement. Therefore, the order of rules is no alteration on the hip, reduce the garment at the hip, and increase the garment at the hip.

The alterations allowed on the waist are a reduction of 1 1/2 inches and an increase of up to 1 inch. The pattern of the garment allows fabric for alterations at the waist.

MIL-S-29432B				HIP					Waist					Thigh		
Slacks, Women's	Size	Low	High	Garment	Ease	Ease	Low	High	Garment	Ease	Ease	Low	High	Garment	Ease	Ease
No hip alteration	12	39.5	41.5	42.5	1	3	27.5	31	30	-1	2.5	23	27	28	1	5
Alter hip -1 alter waist +1 -1.5	12	38.5	41.5	42.5	1	4	27.5	31	30	-1	2.5	23	27	28	1	5
Alter hip +1 alter waist +1 -1.5	12	39.5	42.5	42.5	0	3	27.5	31	30	-1	2.5	23	27	28	1	5
Alter hip +1-1 alter waist +1 -1.5	12	37.5	42.5	42.5	0	5	27	31	30	-1	3	23	27.5	28	0.5	5

5.3 **Marine Women's Dress Coat**

Patterns, military standards, and fit information gathered were utilized in support of the generation of preliminary size selection for the Marine Women's Dress Coat items. The female dress coats are also offered in a tariff of sizes X0 through 18.

Service	MIL SPEC	ITEM
Marine Women's	MIL-C-29453B	Coat, Poly/Wool Blue
Marine Women's	MIL-C-29427B	Coat, Poly/Wool Green

Female Coat Size Selection Methodology

The Women's Dress Coats, MIL-C-29453B and MIL-C-29427B, are the same basic pattern, therefore the same fit concept. They have different MIL numbers because of the styling difference. The measurements utilized in size selection for the coats were the bust, across shoulder, waist, and hip.

The following table provides the garment finished measurements and the body measurements compared generating an expected fit ease target. The garment measurements were derived from the patterns and the body measurements were acquired from the Marine fit manual.

MARINE FEMALE COAT - FINISHED DIMENSIONS

MARINE - SIZE	XO	2	4	6	8	10	12	14	16	18
BUST	35.00	36.00	37.00	38.00	39.50	41.00	42.50	44.50	46.50	48.50
WAIST	28.75	29.75	30.75	31.75	33.25	34.75	36.25	38.25	40.25	42.25
HIP	40.50	41.50	42.50	43.50	45.00	46.50	48.00	50.00	52.00	54.00
ACROSS SHOULDER	16.00	16.25	16.50	16.75	17.00	17.25	17.50	17.75	18.00	18.25

MARINE FEMALE COAT - BODY MEASUREMENT

MARINE - SIZE	XO	2	4	6	8	10	12	14	16	18
BUST	30.50	31.50	32.50	33.50	35.00	36.50	38.00	40.00	42.00	44.00
WAIST	22.50	23.50	24.50	25.50	27.00	28.50	30.00	32.00	34.00	36.00
HIPS	33.00	34.00	35.00	36.00	37.50	39.00	40.50	42.50	44.50	46.50
ACROSS SHOULDER	14.25	14.50	14.75	15.00	15.25	15.50	15.75	16.00	16.25	16.50

MARINE FEMALE COAT - EASE

MARINE - SIZE	XO	2	4	6	8	10	12	14	16	18
BUST	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50
WAIST	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25
HIPS	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50
ACROSS SHOULDER	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75

Rule one is for the standard stock fit. The second rule allows a larger ease range. The third rule incorporates the allowed alterations. Alterations may be made on all seams for a maximum of 1 ½ inch increase or decrease in garment size.

MIL-C-29453B / MIL-C-29427B				Bust					Shld		
Coat, Woman's Poly/wool, Blue	Size	Low	High	Garment	Ease	Ease	Low	High	Garment	Ease	Ease
Stock	12	38.0	39.5	42.5	3	4.5	15.75	16.50	17.50	1	1.75
Ease Range Increase	12	37.5	39.5	42.5	3	5	15.75	17.00	17.50	0.5	1.75
Ease Range Increase - Alter	12	36.5	39.5	42.5	3	6	15.75	17.00	17.50	0.5	1.75

MIL-C-29453B / MIL-C-29427B				Waist					Hip		
Coat, Woman's Poly/wool, Blue	Size	Low	High	Garment	Ease	Ease	Low	High	Garment	Ease	Ease
Stock	12	30.00	31.50	36.25	4.8	6.25	40.5	42.0	48.0	6	7.5
Ease Range Increase	12	29.25	32.25	36.25	4	7	40.0	43.0	48.0	5	8
Ease Range Increase - Alter	12	28.25	33.25	36.25	3	8	39.0	44.0	48.0	4	9

5.4 Marine Women's Shirts

Patterns, military standards, and fit information gathered were utilized in support of the generation of preliminary size selection for the Marine Women's Dress Shirt items. The female long and short sleeve shirts are offered in a tariff of sizes X0 through 18.

Service	MIL SPEC	ITEM
Marine Women's	MIL-S-29368D	Shirt, Long Sleeve and Short Sleeve

Female Shirt Size Selection Methodology

The following table provides the garment finished measurements and the body measurements that correspond to each size for the MIL-S-29368D long and short sleeve shirts. The difference is calculated as ease and is the basis for size selection rule generation.

The measurements utilized in size selection for the shirts were the bust, hip, waist, across shoulder, and neck. The long sleeve and short sleeve shirt have the same

finished measurements for the garment therefore, the same ease measurement or fit ease.

MARINE FEMALE SHIRT - FINISHED DIMENSIONS

MARINE - SIZE	X0	2	4	6	8	10	12	14	16	18
BUST	35.50	36.50	37.50	38.50	40.00	41.50	43.00	45.00	47.00	49.00
WAIST	27.25	28.25	29.25	30.25	31.75	33.25	34.75	36.75	38.75	40.75
HIP (Sweep)	34.38	35.38	36.38	37.38	38.88	40.38	41.88	43.88	45.88	47.88
NECK	12.50	12.75	13.00	13.25	13.50	13.75	14.00	14.25	14.50	14.75
ACROSS SHOULDER	14.50	14.75	15.00	15.25	15.50	15.75	16.00	16.25	16.50	16.75

MARINE FEMALE SHIRT - BODY MEASUREMENT

MARINE - SIZE	X0	2	4	6	8	10	12	14	16	18
BUST	30.50	31.50	32.50	33.50	35.00	36.50	38.00	40.00	42.00	44.00
WAIST	22.50	23.50	24.50	25.50	27.00	28.50	30.00	32.00	34.00	36.00
HIPS(SWEEP)	33.00	34.00	35.00	36.00	37.50	39.00	40.50	42.50	44.50	46.50
HIGH HIP (-3.0 ")	30.00	31.00	32.00	33.00	34.50	36.00	37.50	39.50	41.50	43.50
NECK	12.50	12.75	13.00	13.25	13.50	14.00	14.50	15.00	15.50	16.00
ACROSS SHOULDER	14.25	14.50	14.75	15.00	15.25	15.50	15.75	16.00	16.25	16.50

MARINE FEMALE SHIRT - EASE

MARINE - SIZE	X0	2	4	6	8	10	12	14	16	18
BUST	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
WAIST	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75
HIPS(HIGH HIP)	4.38	4.38	4.38	4.38	4.38	4.38	4.38	4.38	4.38	4.38
NECK	0.00	0.00	0.00	0.00	0.00	-0.25	-0.50	-0.75	-1.00	-1.25
ACROSS SHOULDER	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25

The size selection rules were generated for the shirts based on information provided in the previous tables. The ease ranges used to generate rules are calculated with a relationship to the standard or target ease indicated in the table.

The stock or first rule is written to provide the target and fit ease based on the designer intent. There is a minimum allowance provided on the plus and minus side of the target for minor variances. This should provide the fit designed into the garment pattern at concept. The second rule provides a larger acceptable ease range, thus including a larger range of body measurement variances from the expected body measurements for each size. The last rule includes body measurements that vary extremely from the standard. For example, a recruit has an extremely small waist as compared to the hip and bust measurement for that size. The shirt pattern is a design that allows reduction alterations for the waist and hip. Side seams and front and back seams may be taken in as necessary to produce the required fitted appearance. This is the basis for the third rule.

MIL-S-29368D				Bust					Hip					Waist		
Shirts, Women's Long & Short Sleeve	Size	Low	High	Gmt	Ease	Ease	Low	High	Gmt	Ease	Ease	Low	High	Gmt	Ease	Ease
Stock	12	37.00	39.00	43.00	4	6	36.50	38.50	41.88	3.38	5.38	29.00	31.00	34.75	3.75	5.75
Ease Range Increase	12	37.00	39.50	43.00	3.5	6	36.50	38.88	41.88	3	5.38	29.00	31.75	34.75	3	5.75
Maximum ease - minus alter	12	36.00	39.50	43.00	3.5	7	34.88	38.88	41.88	3	7	27.75	31.75	34.75	3	7

MIL-S-29368D				Shld					Neck		
Shirts, Women's Long & Short Sleeve	Size	Low	High	Gmt	Ease	Ease	Low	High	Gmt	Ease	Ease
Stock	12	15.50	16.00	16.00	0	0.5	15.50	16.00	14.00	-1	1
Ease Range Increase	12	15.25	16.00	16.00	0	0.8	15.25	16.00	14.00	-1	1
Maximum ease - minus alter	12	14.75	16.00	16.00	0	1.3	14.75	16.00	14.00	-1	1

6.0 NAVY FEMALE SIZE SELECTION

Preliminary size selection rules were generated for the female Navy recruit. As with the Marine preliminary rule generation, patterns were utilized as well as military standards.

Information was gathered from the Navy clothing issue staff and was used as a source for rule generation. The women's garments are offered in a tariff of sizes within three body groups: Juniors, Misses, Women's. The garments are offered in a range of sizes within each of these body groups. The lengths offered are based on height as follows: petite 5' 3 1/2" and under, regular 5' 3 1/2" – 5' 7" and tall 5' 7" and above.

The following is a list of the items reviewed for female recruits.

SERVICE	MIL SPEC	ITEM
Navy Women's	A-A-50368A	Coat, All Weather
Navy Women's	MIL-C-29628(NU)	Coat, Svc Dress Blue, P/WI Tropical
Navy Women's		Coat, Svc Dress Blue, Gabardine
Navy Women's	MIL-J-24949(NU)	Jumper, Service Dress, White
Navy Women's	MIL-O-24926A	Overcoat, Melton, Wool, Blue (Peacoat)
Navy Women's	MIL-S-87055B(NU) PD 98-03	Shirt, Poplin, Cotton/Poly, SS, White
Navy Women's	MIL-S-87056A	Shirt, Trop, Poly/Wool, Blue LS (Wash.)
Navy Women's	MIL-S-29629(NU)	Skirt, Polyester White - SDW
Navy Women's	MIL-S-29629(NU)	Skirt, Polyester/Wool Blue - WB
Navy Women's	MIL-S-29629(NU)	Skirt, Polyester/Cotton White - SW
Navy Women's	MIL-S-29631	Skirt, Poly/Wool Tropical Blue - SDB
Navy Women's	MIL-S-24948A	Slack, Polyester/Wool Blue - WB Type I
Navy Women's	MIL-S-24948A	Slack, Polyester/Wool Blue - WB Type II
Navy Women's	MIL-S-24948A	Slack, Polyester White - SDW Type I
Navy Women's	MIL-S-24948A	Slack, Polyester White - SDW Type II
Navy Women's	MIL-S-24948A	Slack, Polyester/Cotton White - SW Type I
Navy Women's	MIL-S-24948A	Slack, Polyester/Cotton White - SW Type II
Navy Women's	MIL-S-29630	Slack, Poly/Wool Tropical Blue - SDB

6.1 **Navy Female Skirts**

Evaluation of information obtained from patterns and military standards pertaining to the Navy women's skirt and slack patterns were utilized as the basis for preliminary size selection tables. The women's garments are offered in a tariff of sizes within three body groups: Juniors, Misses, Women's. The skirts are offered in 10J – 16J, 4M – 20M, and 6W – 18W. The following skirt garments were reviewed.

Service	MIL SPEC	ITEM
Navy Women's	MIL-S-29629(NU)	Skirt, Polyester White – SDW
Navy Women's	MIL-S-29629(NU)	Skirt, Polyester/Wool Blue – WB
Navy Women's	MIL-S-29629(NU)	Skirt, Polyester/Cotton White – SW
Navy Women's	MIL-S-29631	Skirt, PolyWool Tropical Blue – SDB

(SDW-Summer Dress White, SDB-Summer Dress Blue, WB-Winter Blue, SW-Summer White)

Patterns were received based on Mil number. The Mil Standard includes several items on the women's list. The MIL-S-29629 patterns are used to generate three skirts of different fabrics, which are three different styles. The MIL-S-29631 patterns are for the Summer Dress Blue skirt only. Therefore a total of two skirt patterns sets were reviewed.

Skirt Size Selection Methodology

The following table provides the garment finished measurements and the body measurements that correspond to each size for the MIL-S-29629 skirt. The difference is calculated as ease and is the basis for size selection rule generation.

MIL-S-29629 -Skirt

SDW - SW -SB

JUNIOR GARMENT FINISHED MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
WAIST				28	29 1/2	31	33		
HIP				39	40 1/2	42	44		
THIGHS				41	42 1/2	44	46		

MISSES GARMENT FINISHED MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
WAIST	24 1/2	25 1/2	26 1/2	28	29 1/2	31	33	35	37
HIP	37 1/4	38 1/4	39 1/4	40 3/4	42 1/4	43 3/4	45 3/4	47 3/4	49 3/4
THIGHS	39 1/4	40 1/4	41 1/4	42 3/4	44 1/4	45 3/4	47 3/4	49 3/4	51 3/4

WOMEN GARMENT FINISHED MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
WAIST		25 1/2	26 1/2	28	29 1/2	31	33	35	
HIP		40 1/4	41 1/4	42 3/4	44 1/4	45 3/4	47 3/4	49 3/4	
THIGHS		42 1/4	43 1/4	44 3/4	46 1/4	47 3/4	49 3/4	51 3/4	

FEMALE BODY MEASUREMENTS									
NAVY - SIZE	4	6	8	10	12	14	16	18	20
WAIST J-M-W	24 1/2	25 1/2	26 1/2	28	29 1/2	31	33	35	37
HIP-J				36 1/2	38	39 1/2	41 1/2		
HIP-M	35	36	37	38 1/2	40	41 1/2	43 1/2	45 1/2	47 1/2
HIP-W			38	39	40 1/2	42	43 1/2	45 1/2	47 1/2
THIGHS-J				36.25	37.75	39.25	41.25		
THIGHS-M	35.00	36.00	37.00	38.00	39.50	41.00	43.00	45.00	47.00
THIGHS-W			37.75	38.75	40.00	41.50	43.00	45.00	47.00

EASE									
Female Size-J				10J	12J	14J	16J		
Waist				0	0	0	0		
Hip				2 1/2	2 1/2	2 1/2	2 1/2		
Thighs				4 3/4	4 3/4	4 3/4	4 3/4		
Female Size-M	4M	6M	8M	10M	12M	14M	16M	18M	20M
Waist	0	0	0	0	0	0	0	0	0
Hip	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4
Thighs	4 1/4	4 1/4	4 1/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4
Female Size-W		6W	8W	10W	12W	14W	16W	18W	
Waist		0	0	0	0	0	0	0	
Hip		2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	
Thighs		4 1/2	4 1/2	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	

The following table provides the garment finished measurements and the body measurements that correspond to each size for the MIL-S-29631 skirt. The difference is calculated as ease and is the basis for size selection rule generation.

MIL-S-29631 - Skirt

JUNIOR GARMENT FINISHED MEASUREMENTS									
SDB	4	6	8	10	12	14	16	18	20
NAVY - SIZE									
WAIST				28	29 1/2	31	33		
HIP				39	40 1/2	42	44		
THIGHS				40 1/2	43	44 1/2	46 1/2		

MISSES GARMENT FINISHED MEASUREMENTS

MISSES GARMENT FINISHED MEASUREMENTS	4	6	8	10	12	14	16	18	20
NAVY - SIZE									
WAIST	24 1/2	25 1/2	26 1/2	28	29 1/2	31	33	35	37
HIP	36 1/2	37 1/2	38 1/2	40	41 1/2	43	45	47	49
THIGHS	38 1/2	39 1/2	40 1/2	42	43 1/2	45	47	49	51

WOMEN GARMENT FINISHED MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
WAIST		25 1/2	26 1/2	28	29 1/2	31	33	35	
HIP		39 1/2	40 1/2	42	43 1/2	45	47	49	
THIGHS		41 1/2	42 1/2	44	45 1/2	47	49	51	

FEMALE BODY MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
WAIST J-M-W	24 1/2	25 1/2	26 1/2	28	29 1/2	31	33	35	37
HIP-J		34	35	36 1/2	38	39 1/2	41 1/2		
HIP-M	35	36	37	38 1/2	40	41 1/2	43 1/2	45 1/2	47 1/2
HIP-W		38	39	40 1/2	42	43 1/2	45 1/2	47 1/2	
THIGHS-J				36.25	37.75	39.25	41.25		
THIGHS-M	35.00	36.00	37.00	38.00	39.50	41.00	43.00	45.00	47.00
THIGHS-W		37.75	38.75	40.00	41.50	43.00	45.00	47.00	

EASE

Female Size-J	4M	6M	8M	10M	12M	14M	16M	18M	20M
Waist	0	0	0	0	0	0	0	0	0
Hip		1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Thighs	3 1/2	3 1/2	3 1/2	4	4	4	4	4	4
Female Size-M	4W	6W	8W	10W	12W	14W	16W	18W	
Waist		0	0	0	0	0	0	0	0
Hip	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Thighs	3 3/4	3 3/4	3 3/4	4	4	4	4	4	4
Female Size-W	6W	8W	10W	12W	14W	16W	18W		
Waist		0	0	0	0	0	0	0	0
Hip	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Thighs	3 3/4	3 3/4	3 3/4	4	4	4	4	4	4

The Navy female garments are available in a larger range of sizes to fit a more diverse range of body measurements. This allows the Navy to issue the majority of their garments without alterations. The waist of the Junior, Misses, and Women's sizes is the same. The hip changes between the Junior and the Misses and the Women's as the following table indicates.

Size Garment	Waist Mil-S-29629 Mil-S- 29631	Hip Mil-S-29629	Hip Mil-S- 29631
Junior 10	28	39	39
Misses 10	28	40 1/4	40
Women's 10	28	42 1/4	42

The size selection rules were generated for the skirts based on information provided in the previous tables. The ease ranges used to generate rules are calculated with a specific relationship to the standard or target ease. The body measurements for each size are the same from garment to garment. The garment measurements may vary based on the intent of the designer and the use of the product.

The skirts are issued from stock without alterations. The stock or first rule is written to provide the target and fit ease based on the designer intent. There is a minimum allowance provided on the plus and minus side of the target for minor variances. This should provide the fit designed into the garment pattern at concept. The second rule provides a larger acceptable ease range, thus including a larger range of different body shapes. The last rule includes body measurements that could not be acceptable within the fit concept of the garment. This rule is provided to capture the most extreme of body measurements. The following table is an illustration of the blue dress skirt. A sample of all skirt rules is included in the appendix.

MIL-S29631				HIP	1.5	2.5			Waist	0	0			Thighs	3.5	5.25
Blue Dress Skirt	Size	Low	High	Gmt	Ease	Ease	Low	High	Gmt	Ease	Ease	Low	High	Gmt	Ease	Ease
Stock	10M	37.5	38.5	40	1.5	2.5	26.5	27.5	28	0.5	1.5	37	40	42	2	5
Ease range increase acceptable	10M	36	38.5	40	1.5	4	26	27.5	28	0.5	2	37	40	42	2	5
Maximum ease - may alter	10M	35	38.5	40	1.5	5	25	27.5	28	0.5	3	35	40.5	42	1.5	7

6.2 Navy Female Slacks

The Mil-S-24948A standard includes three slacks of different fabrics, which are three different styles. In addition, this Mil offered two variations of the slack, Type I and Type II. The MIL-S-29630 patterns are for the Summer Dress Blue slack only. Therefore a total of three slack patterns were reviewed. The slacks are offered in 10J – 16J, 4M – 20M, and 6W – 18W.

	MIL SPEC	ITEM
Women's	MIL-S-24948A	Slack, Polyester/Wool Blue - WB Type I
Women's	MIL-S-24948A	Slack, Polyester/Wool Blue - WB Type II
Women's	MIL-S-24948A	Slack, Polyester White - SDW Type I
Women's	MIL-S-24948A	Slack, Polyester White - SDW Type II
Women's	MIL-S-24948A	Slack, Polyester/Cotton White - SW Type I
Women's	MIL-S-24948A	Slack, Polyester/Cotton White - SW Type II
Women's	MIL-S-29630	Slack, Poly/Wool Tropical Blue - SDB

(SDW-Summer Dress White, SDB-Summer Dress Blue, WB-Winter Blue, SW-Summer White)

Slack Size Selection Methodology

The following tables provide the garment finished measurements and the body measurements that correspond to each size for the MIL-S-24948 and MIL-S-29630 slack. The difference is calculated as ease and is the basis for size selection rule generation.

The slacks patterns were created with an outlet in the back waist seam to allow for alteration. Even with the larger size range incorporating Junior, Misses and Women's the opportunity to require an alteration does exist. The rules were written based on the target ease calculated in the following tables and the alteration allowance at the waist of up to 1 inch.

The first rule is for the stock or target recruit measurements and fit ease. A small allowance in the plus and minus direction is allowed retaining the expected fit criteria. The second rule allows for increased ease without alterations. The third rule utilizes the possibility of allowing a reduction of the waist based on allowed alterations. The fourth and last rule utilizes the maximum allowance on all measurements to capture any extreme measurement changes.

MIL-S-24948
SDW - SW -WB Slack

TYPE I -STRAIGHT LEG
JUNIOR GARMENT FINISHED MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
WAIST				28	29 1/2	31	33		
HIP				40	41 1/4	43	45		
THIGH				25 1/2	26 1/4	27	27 3/4		

MISSES GARMENT FINISHED MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
WAIST	24 1/2	25 1/2	26 1/2	28	29 1/2	31	33	35	37
HIP	38	39	40	41 1/2	43	44 1/2	46 1/2	48 1/2	50 1/2
THIGH	25 1/4	25 3/4	26 1/4	27	27 3/4	28 1/2	29 1/2	30 1/2	31 1/2

WOMEN GARMENT FINISHED MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
WAIST		25 1/2	26 1/2	28	29 1/2	31	33	35	
HIP		41	41 1/2	43 1/2	45 1/2	46 1/2	48 1/2	50 1/2	
THIGH		26 1/4	26 3/4	27 1/2	28 1/4	29	30	31	

FEMALE BODY MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
WAIST J-M-W	24 1/2	25 1/2	26 1/2	28	29 1/2	31	33	35	37
HIP-J		34	35	36 1/2	38	39 1/2	41 1/2		
HIP-M	35	36	37	38 1/2	40	41 1/2	43 1/2	45 1/2	47 1/2
HIP-W		38	39	40 1/2	42	43 1/2	45 1/2	47 1/2	
THIGH-J		21 3/4	22 1/4	23	23 3/4	24 1/2	25 1/2		
THIGH-M	22 1/4	22 3/4	23 1/4	24	24 3/4	25 1/2	26 1/2	27 1/2	28 1/2
THIGH-W		23 3/4	24 1/4	25	25 3/4	26 1/2	27 1/2	28 1/2	

EASE

Female Size-J				10J	12J	14J	16J		
Waist				0	0	0	0		
Hip				3 1/2	3 1/4	3 1/2	3 1/2		
Thigh				2 1/2	2 1/2	2 1/2	2 1/4		
Female Size-M	4M	6M	8M	10M	12M	14M	16M	18M	20M
Waist	0	0	0	0	0	0	0	0	0
Hip	3	3	3	3	3	3	3	3	3
Thigh	3	3	3	3	3	3	3	3	3
Female Size-W		6W	8W	10W	12W	14W	16W	18W	
Waist		0	0	0	0	0	0	0	
Hip		3	2 1/2	3	3 1/2	3	3	3	
Thigh		2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	

MIL-S-24948

SDW - SW -WB Slack

TYPE II -BELL BOTTOM LEG
JUNIOR GARMENT FINISHED MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
WAIST				28	29 1/2	31	33		
HIP				38 3/4	40 1/4	41 3/4	43 3/4		
THIGH				25	25 3/4	26 1/2	27 1/2		

MISSES GARMENT FINISHED MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
WAIST	24 1/2	25 1/2	26 1/2	28	29 1/2	31	33	35	37
HIP	36 3/4	37 3/4	38 3/4	40 1/4	41 3/4	43 1/4	45 1/4	47 1/4	49 1/4
THIGH	24 3/4	25 1/4	25 3/4	26 1/2	27 1/4	28	29	30	31

WOMEN GARMENT FINISHED MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
WAIST			25 1/2	26 1/2	28	29 1/2	31	33	35
HIP			39 3/4	40 3/4	42 1/4	43 3/4	45 1/4	47 1/4	49 1/4
THIGH			26 1/4	26 3/4	27 1/2	28 1/4	29	30	31

FEMALE BODY MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
WAIST J-M-W	24 1/2	25 1/2	26 1/2	28	29 1/2	31	33	35	37
HIP-J			34	35	36 1/2	38	39 1/2	41 1/2	
HIP-M	35	36	37	38 1/2	40	41 1/2	43 1/2	45 1/2	47 1/2
HIP-W			38	39	40 1/2	42	43 1/2	45 1/2	47 1/2
THIGH-J			21 3/4	22 1/4	23	23 3/4	24 1/2	25 1/2	
THIGH-M	22 1/4	22 3/4	23 1/4	24	24 3/4	25 1/2	26 1/2	27 1/2	28 1/2
THIGH-W			23 3/4	24 1/4	25	25 3/4	26 1/2	27 1/2	28 1/2

EASE

Female Size-J				10J	12J	14J	16J		
Waist				0	0	0	0		
Hip				2 1/4	2 1/4	2 1/4	2 1/4		
Thigh				2	2	2	2		
Female Size-M	4M	6M	8M	10M	12M	14M	16M	18M	20M
Waist	0	0	0	0	0	0	0	0	0
Hip	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4
Thigh	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
Female Size-W		6W	8W	10W	12W	14W	16W	18W	
Waist		0	0	0	0	0	0	0	
Hip		1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	
Thigh		2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	

MIL-S-29630

SDB Slack

JUNIOR GARMENT FINISHED MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
WAIST				28	29 1/2	31	33		
HIP				39 1/4	40 3/4	42 1/4	44 1/4		
THIGH				25 1/2	26 1/4	27	28		

MISSES GARMENT FINISHED MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
WAIST	24 1/2	25 1/2	26 1/2	28	29 1/2	31	33	35	37
HIP	37 1/2	38 1/2	39 1/2	41	42 1/2	44	46	48	50
THIGH	24 3/4	25 1/4	25 3/4	26 1/2	27 1/4	28	29	30	31

WOMEN GARMENT FINISHED MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
WAIST		25 1/2	26 1/2	28	29 1/2	31	33	35	
HIP		40 1/2	41 1/2	43	44 1/2	46	48	50	
THIGH		26 1/4	26 3/4	27 1/2	28 1/4	29	30	31	

FEMALE BODY MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
WAIST J-M-W	24 1/2	25 1/2	26 1/2	28	29 1/2	31	33	35	37
HIP-J		34	35	36 1/2	38	39 1/2	41 1/2		
HIP-M	35	36	37	38 1/2	40	41 1/2	43 1/2	45 1/2	47 1/2
HIP-W		38	39	40 1/2	42	43 1/2	45 1/2	47 1/2	
THIGH-J		21 3/4	22 1/4	23	23 3/4	24 1/2	25 1/2		
THIGH-M	22 1/4	22 3/4	23 1/4	24	24 3/4	25 1/2	26 1/2	27 1/2	28 1/2
THIGH-W		23 3/4	24 1/4	25	25 3/4	26 1/2	27 1/2	28 1/2	

EASE

Female Size-J				10J	12J	14J	16J		
Waist				0	0	0	0		
Hip				2 3/4	2 3/4	2 3/4	2 3/4		
Thigh				2 1/2	2 1/2	2 1/2	2 1/2		
Female Size-M	4M	6JM	8M	10M	12M	14M	16M	18M	20M
Waist	0	0	0	0	0	0	0	0	0
Hip	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
Thigh	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
Female Size-W		6W	8W	10W	12W	14W	16W	18W	
Waist		0	0	0	0	0	0	0	
Hip		2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	
Thigh		2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	

All three slack patterns size selection rules were generated with this same methodology.

A sample of each is provided in the appendix.

MIL-S24948				HIP	2.5	3.5			Waist	0	0			Thigh	2.5	3
Slack Svc Dress Wool: Poly/wool	Size	Lower	Upper	Garment	Ease	Ease	Lower	Upper	Garment	Ease	Ease	Lower	Upper	Garment	Ease	Ease
Stock	10M	38.00	39.00	41 1/2	2.5	3.5	26.50	27.50	28	0.5	1.5	23.00	25.00	27	2	4
Increase in hip ease	10M	37.00	39.00	41 1/2	2.5	4.5	26.50	27.50	28	0.5	1.5	22.00	25.00	27	2	5
Waist ease -1 0 inch alter	10M	37.00	39.00	41 1/2	2.5	4.5	25.50	27.50	28	0.5	2.5	22.00	25.00	27	2	5
Maximum ease - +/- 1.0 waist alter	10M	36.00	40.00	41 1/2	1.5	5.5	25.50	28.50	28	-0.5	2.5	21.00	25.50	27	1.5	6

6.3 Navy Female Jumper and Dress Coat

Evaluation of information obtained from patterns and military standards pertaining to the Navy women's coat and jumper patterns were utilized as the basis for preliminary size selection tables. The following garments were reviewed.

SERVICE	MIL SPEC	ITEM
Navy Women's	MIL-C-29628(NU)	Coat, Svc Dress Blue, P/WI Tropical
Navy Women's		Coat, Svc Dress Blue, Gabardine
Navy Women's	MIL-J-24949(NU)	Jumper, Service Dress, White

The women's garments are offered in a tariff of sizes within three body groups: Juniors, Misses, Women's. The female dress coat is offered in the following tariff sizes: Juniors 4J-28J, Misses 4M-28M, Women's 4W-28W. The female jumper is offered in the following tariff sizes: Juniors 10J-16J, Misses 4M-20M, Women's 6W-18W. The dress coat has a wider range of sizes than all other garments being reviewed including the jumper, slacks, and skirts. This wider tariff will allow for fitting a larger variability of measurements from the expected and minimize alterations required.

Dress Coat Size Selection Methodology

The following table provides the garment finished measurements and the body measurements that correspond to each size for the MIL-C-29628 coat. The difference is calculated as ease and is the basis for size selection rule generation.

The measurements utilized in size selection for the dress coat were the bust, waist, hip and across shoulder. The ease per measurement was consistent across the range of sizes within a body type: Junior, Misses, Women's. For example, the expected bust ease was 3 inches for all sizes in the Junior range. The ease for the Junior waist, hip, and across shoulder were also consistent across the range of sizes from 4 through 28.

JUNIOR GARMENT FINISHED MEASUREMENTS

MIL-C-29628 COAT

NAVY - SIZE	4	6	8	10	12	14	16	18	20	22	24	26	28
BUST	35 1/2	36 1/2	37 1/2	39	40 1/2	42	44	46	48	50	52	54	56
WAIST	29	30	31	32 1/2	34	35 1/2	37 1/2	39 1/2	41 1/2	43 1/2	45 1/2	47 1/2	49 1/2
HIP/SWEEP	39	40	41	42 1/2	44	45 1/2	47 1/2	49 1/2	51 1/2	53 1/2	55 1/2	57 1/2	59 1/2
ACROSS SHOULDER	15 1/4	15 1/2	15 3/4	16	16 1/4	16 1/2	16 3/4	17	17 1/4	17 1/2	17 3/4	18	18 1/4

MISSES GARMENT FINISHED MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20	22	24	26	28
BUST	35 1/2	36 1/2	37 1/2	39	40 1/2	42	44	46	48	50	52	54	56
WAIST	29	30	31	32 1/2	34	35 1/2	37 1/2	39 1/2	41 1/2	43 1/2	45 1/2	47 1/2	49 1/2
HIP/SWEEP	40 1/2	41 1/2	42 1/2	44	45 1/2	47	49	51	53	55	57	59	61
ACROSS SHOULDER	15 1/4	15 1/2	15 3/4	16	16 1/4	16 1/2	16 3/4	17	17 1/4	17 1/2	17 3/4	18	18 1/4

WOMEN GARMENT FINISHED MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20	22	24	26	28
BUST	35 1/2	36 1/2	37 1/2	39	40 1/2	42	44	46	48	50	52	54	56
WAIST	29	30	31	32 1/2	34	35 1/2	37 1/2	39 1/2	41 1/2	43 1/2	45 1/2	47 1/2	49 1/2
HIP/SWEEP	42	43	44	45 1/2	47	48 1/2	50 1/2	52 1/2	53 1/2	55 1/2	57 1/2	59 1/2	61 1/2
ACROSS SHOULDER	15 1/4	15 1/2	15 3/4	16	16 1/4	16 1/2	16 3/4	17	17 1/4	17 1/2	17 3/4	18	18 1/4

FEMALE BODY MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20	22	24	26	28
BUST-J	32 1/2	33 1/2	34 1/2	36	37 1/2	39	41	43	45	47	49	51	53
BUST-M	32 1/2	33 1/2	34 1/2	36	37 1/2	39	41	43	45	47	49	51	53
BUST-W	32 1/2	33 1/2	34 1/2	36	37 1/2	39	41	43	45	47	49	51	53
WAIST J-M-W	24 1/2	25 1/2	26 1/2	28	29 1/2	31	33	35	37	39	41	43	45
HIP-J	33	34	35	36 1/2	38	39 1/2	41 1/2	43 1/2	45 1/2	47 1/2	49 1/2	51 1/2	53 1/2
HIP-M	35	36	37	38 1/2	40	41 1/2	43 1/2	45 1/2	47 1/2	49 1/2	51 1/2	53 1/2	55 1/2
HIP-W	37	38	39	40 1/2	42	43 1/2	45 1/2	47 1/2	49 1/2	51 1/2	53 1/2	55 1/2	57 1/2
ACROSS SHOULDER-J	14 3/4	15	15 1/4	15 1/2	15 3/4	16	16 1/4	16 1/2	16 3/4	17	17 1/4	17 1/2	17 3/4
ACROSS SHOULDER-M	14 3/4	15	15 1/4	15 1/2	15 3/4	16	16 1/4	16 1/2	16 3/4	17	17 1/4	17 1/2	17 3/4
ACROSS SHOULDER-W	14 3/4	15	15 1/4	15 1/2	15 3/4	16	16 1/4	16 1/2	16 3/4	17	17 1/4	17 1/2	17 3/4

		MIL-C-29628 FEMALE COAT EASE												
Female Size-J		4J	6J	8J	10J	12J	14J	16J	18J	20J	22J	24J	26J	28J
Bust		3	3	3	3	3	3	3	3	3	3	3	3	3
Waist		4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2
Hip		6	6	6	6	6	6	6	6	6	6	6	6	6
Across Shoulder		1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Female Size-M		4M	6M	8M	10M	12M	14M	16M	18M	20M	22M	24M	26M	28M
Bust		3	3	3	3	3	3	3	3	3	3	3	3	3
Waist		4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2
Hip		5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2
Across Shoulder		1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Female Size-W		4W	6W	8W	10W	12W	14W	16W	18W	20W	22W	24W	26W	28W
Bust		3	3	3	3	3	3	3	3	3	3	3	3	3
Waist		4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2
Hip		5	5	5	5	5	5	5	5	4	4	4	4	4
Across Shoulder		1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2

The female garments are available in a larger range of sizes to fit a more diverse range of body measurements. The bust, waist, and across shoulder ease of the Junior, Misses, and Women's sizes are the same. The hip varies $\frac{1}{2}$ inch from the Junior to the Misses and $\frac{1}{2}$ inch from the Misses to the Women's.

<u>Size Garment</u>	Bust Ease	Waist Ease	Hip Ease	Across Shoulder Ease
Junior 10	3	4 1/2	6	1/2
Misses 10	3	4 1/2	5 1/2	1/2
Women's 10	3	4 1/2	5	1/2

The size selection rules were generated for the coats based on information provided in the previous tables. The ease ranges used to generate rules are calculated with a specific relationship to the standard or target ease. The body measurements for each size are the same from garment to garment. The garment measurements and thus the ease may vary based on the intent of the designer and the use of the product.

The stock or first rule is written to provide the target and fit ease based on the designer intent. There is a minimum allowance provided on the plus and minus side of the target for minor variances. This should provide the fit designed into the garment pattern at

concept. The second rule provides a larger acceptable ease range, thus including a larger range of body measurement variances from the expected body measurements for each size. For example, if the size 10 recruit was very close to the expected body measurement for the bust and hip but was much larger in the waist a size larger may be issued. Therefore, more ease than the target is accepted for the standard measurements to accommodate the waist or measurement with the largest variance from expected to be accommodated. This is necessary to reduce the need for alterations. The last rule includes body measurements that could not be acceptable within the fit concept of the garment. This rule is provided to capture the most extreme of body measurements.

MIL- C-29628			Across	Shld	0.5				Bust	3	
Coat, Svc Dress Blue	Size	Low	High	Garment	Ease	Ease	Low	High	Garment	Ease	Ease
Stock	10M	15.25	15.75	16.00	0.25	0.75	35.0	37.0	39.0	2	4
Ease range increase acceptable	10M	15.00	15.75	16.00	0.25	1	34.0	37.0	39.0	2	5
Maximum ease - may alter	10M	14.75	16.00	16.00	0	1.25	33.0	37.5	39.0	1.5	6

MIL- C-29628				Waist	4.5				Hip	5.5	
Coat, Svc Dress Blue	Size	Low	High	Garment	Ease	Ease	Low	High	Garment	Ease	Ease
Stock	10M	27.0	29.0	32.5	3.5	5.5	37.5	39.5	44.0	4.5	6.5
Ease range increase acceptable	10M	26.0	29.5	32.5	3	6.5	37.0	41.0	44.0	3	7
Maximum ease - may alter	10M	26.0	29.5	32.5	2.5	7.5	36.0	42.0	44.0	2	8

Dress Jumper Size Selection Methodology

The following table provides the garment finished measurements and the body measurement that corresponds to each size for the MIL-J-24949 Jumper. The difference is calculated as ease and is the basis for size selection rule generation.

JUNIOR GARMENT FINISHED MEASUREMENTS**MIL-J-24949 JUMPER**

NAVY - SIZE	4	6	8	10	12	14	16	18	20
BUST				39 3/4	41 1/4	42 3/4	44 3/4		
WAIST				39 1/2	41	42 1/2	44 1/2		
HIP/SWEEP				41	42 1/2	44	46		
ACROSS SHOULDER				16 1/2	17	17 1/2	18		

MISSES GARMENT FINISHED MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
BUST	36 1/4	37 1/4	38 1/4	39 3/4	41 1/4	42 3/4	44 3/4	46 3/4	48 3/4
WAIST	36 1/2	37 1/2	38 1/2	40	41 1/2	43	45	47	49
HIP/SWEEP	39	40	41	42 1/2	44	45 1/2	47 1/2	49 1/2	51 1/2
ACROSS SHOULDER	15	15 1/2	16	16 1/2	17	17 1/2	18	18 1/2	19

WOMEN GARMENT FINISHED MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
BUST		37 1/4	38 1/4	39 3/4	41 1/4	42 3/4	44 3/4	46 3/4	
WAIST		38	39	40 1/2	42	43 1/2	45 1/2	47 1/2	
HIP/SWEEP		42	43	44 1/2	46	47 1/2	49 1/2	51 1/2	
ACROSS SHOULDER		15 1/2	16	16 1/2	17	17 1/2	18	18 1/2	

FEMALE BODY MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
BUST-J				36	37 1/2	39	41		
BUST-M	32 1/2	33 1/2	34 1/2	36	37 1/2	39	41	43	45
BUST-W		33 1/2	34 1/2	36	37 1/2	39	41	43	
WAIST J-M-W	24 1/2	25 1/2	26 1/2	28	29 1/2	31	33	35	37
HIP-J				36 1/2	38	39 1/2	41 1/2		
HIP-M	35	36	37	38 1/2	40	41 1/2	43 1/2	45 1/2	47 1/2
HIP-W		38	39	40 1/2	42	43 1/2	45 1/2	47 1/2	
ACROSS SHOULDER-J	14 3/4	15	15 1/4	15 1/2	15 3/4	16	16 1/4	16 1/2	16 3/4
ACROSS SHOULDER-M	14 3/4	15	15 1/4	15 1/2	15 3/4	16	16 1/4	16 1/2	16 3/4
ACROSS SHOULDER-W	14 3/4	15	15 1/4	15 1/2	15 3/4	16	16 1/4	16 1/2	16 3/4

MIL-J-24949 FEMALE JUMPER EASE									
Female Size-J				10J	12J	14J	16J		
Bust				3 3/4	3 3/4	3 3/4	3 3/4		
Waist				11 1/2	11 1/2	11 1/2	11 1/2		
Hip				4 1/2	4 1/2	4 1/2	4 1/2		
Across Shoulder				1	1 1/4	1 1/2	1 3/4		
Female Size-M	4M	6M	8M	10M	12M	14M	16M	18M	20M
Bust	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4
Waist	12	12	12	12	12	12	12	12	12
Hip	4	4	4	4	4	4	4	4	4
Across Shoulder	1/4	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4
Female Size-W		6W	8W	10W	12W	14W	16W	18W	
Bust		3 3/4	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4
Waist		12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2
Hip		4	4	4	4	4	4	4	4
Across Shoulder		1/2	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4

The measurements utilized in size selection for the dress jumper are the same as the coat, which were the bust, waist, and hip, and across shoulder. The ease per measurement was not as consistent across the range of sizes within a body type as was the dress coat. The across shoulder appeared to be the most inconsistent varying between sizes across the size range. This was due to the change between sizes at the shoulder referred to as grading. The body measurement chart across shoulder changes by $\frac{1}{4}$ inch as the sizes go up. The coat across shoulder measurement also changed by $\frac{1}{4}$ inch, which maintained consistency with the body measurement, therefore, the fit ease. The jumper garment graded by $\frac{1}{2}$ inch as sizes went up therefore increasing the ease by $\frac{1}{4}$ inch with each size. In effect the jumper did not fit as closely as the coat. The type of garment the jumper is versus a fitted dress coat may allow more variance. The previous table provides the jumper garment measurements, the body measurements, and the result of the ease calculations.

MIL- J - 24949			Across	Shld	0.5	2.25			Bust	3.75	
Jumper, Svc Dress White	Size	Low	High	Garment	Ease	Ease	Low	High	Garment	Ease	Ease
Stock	10M	14.00	16.00	16.50	0.5	2.5	35.00	37.00	39.75	2.75	4.75
Ease range increase acceptable	10M	13.50	16.00	16.50	0.5	3	34.00	37.75	39.75	2	5.75
Maximum ease - may alter	10M	13.00	16.00	16.50	0.5	3.5	32.75	38.25	39.75	1.5	7

MIL- J - 24949				Waist	12				Hip	4	
Jumper, Svc Dress White	Size	Low	High	Garment	Ease	Ease	Low	High	Garment	Ease	Ease
Stock	10M	26.0	30.0	40.0	10	14	37.5	39.5	42.5	3	5
Ease range increase acceptable	10M	26.0	31.0	40.0	9	14	36.5	40.5	42.5	2	6
Maximum ease - may alter	10M	25.0	32.0	40.0	8	15	33.5	41.0	42.5	1.5	9

6.4 Navy Female Long and Short Sleeve Shirts

Evaluation of information obtained from patterns and military standards pertaining to the Navy women's long sleeve and short sleeve shirt patterns were utilized as the basis for preliminary size selection tables. The following garments were reviewed.

SERVICE	MIL SPEC	ITEM
Navy Women's	MIL-S-87055B(NU) PD 98-03	Shirt, Poplin, Cotton/Poly, SS, White
Navy Women's	MIL-S-87056A	Shirt, Trop, Poly/Wool, Blue LS (Wash.)

The female long sleeve shirts are offered in a tariff of sizes based on neck, bust, and sleeve length. The female short sleeve shirts are offered in a tariff of sizes based on neck and bust. Both garments are offered in bust sizes 32 through 44. Each of these sizes is available in neck sizes 12 through 16. This wider tariff of neck sizes will allow for fitting a larger variability of measurements.

Female Shirt Size Selection Methodology

The following table provides the garment finished measurements and the body measurements that correspond to each size for the MIL-S87056 Long Sleeve

Shirt and the following table corresponds to each size for the PD 98-03 Short Sleeve Shirt. The difference is calculated as ease and is the basis for size selection rule generation.

The measurements utilized in size selection for the shirts were the neck, bust, waist, hip and across shoulder. The long sleeve and short sleeve shirt have the same finished measurements for the garment on the bust, waist, hip, and across shoulder therefore, the same ease measurement or fit ease. The garment neck measurement on the short sleeve shirt allows more ease than the long sleeve shirt with $\frac{3}{4}$ " ease on the short sleeve verses $\frac{1}{4}$ " ease on the long sleeve shirt neck.

MIL-S-87056 LS SHIRT

COLLAR/NECK OPTIONS

NECK SIZE	12	13	14	15	16
COLLAR	12 1/4	13 1/4	14 1/4	15 1/4	16 1/4

GARMENT FINISHED MEASUREMENTS

NAVY - SIZE	32	34	36	38	40	42	44
BUST	38	40	42	44	46	48	50
WAIST	32 3/4	34 3/4	36 3/4	38 3/4	40 3/4	42 3/4	44 3/4
HIP/SWEEP	37 1/2	39 1/2	41 1/2	43 1/2	45 1/2	47 1/2	49 1/2
ACROSS SHLD N_12	14 3/4	15	15 1/4	15 1/2	15 3/4	16	16 1/4
ACROSS SHLD N_13	15 1/4	15 1/2	15 3/4	16	16 1/4	16 1/2	16 3/4
ACROSS SHLD N_14	15 3/4	16	16 1/4	16 1/2	16 3/4	17	17 1/4
ACROSS SHLD N_15	16 1/4	16 1/2	16 3/4	17	17 1/4	17 1/2	17 3/4
ACROSS SHLD N_16	16 3/4	17	17 1/4	17 1/2	17 3/4	18	18 1/4

	4-6	8	10-12	14	16	18	20
Shirt Size	32	34	36	38	40	42	44
Body Measure							
Bust	32.5	34.5	37	39	41	43	45
Waist	25 1/2	27	29	31	33	35	37
Hip	33	35	37	39	42	45	47 1/2
Across Shoulder	15	15 1/2	15 3/4	16	16 1/4	16 1/2	16 3/4
Shirt Size	32	34	36	38	40	42	44

Garment Ease							
Bust	5 1/2	5 1/2	5	5	5	5	5
Waist	7 1/4	7 3/4	7 3/4	7 3/4	7 3/4	7 3/4	7 3/4
Hip	4 1/2	4 1/2	4 1/2	4 1/2	3 1/2	2 1/2	2
ACROSS SHLD N_12	- 1/4	- 1/2	- 1/2	- 1/2	- 1/2	- 1/2	- 1/2
ACROSS SHLD N_13	1/4	0	0	0	0	0	0
ACROSS SHLD N_14	3/4	1/2	1/2	1/2	1/2	1/2	1/2
ACROSS SHLD N_15	1 1/4	1	1	1	1	1	1
ACROSS SHLD N_16	1 3/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2

FEMALE BODY MEASUREMENTS

NAVY - SIZE	4	6	8	10	12	14	16	18	20
BUST-J	32 1/2	33 1/2	34 1/2	36	37 1/2	39	41	43	45
BUST-M	32 1/2	33 1/2	34 1/2	36	37 1/2	39	41	43	45
BUST-W	32 1/2	33 1/2	34 1/2	36	37 1/2	39	41	43	45
WAIST J-M-W	24 1/2	25 1/2	26 1/2	28	29 1/2	31	33	35	37
HIP-J	33	34	35	36 1/2	38	39 1/2	41 1/2	43 1/2	45 1/2
HIP-M	35	36	37	38 1/2	40	41 1/2	43 1/2	45 1/2	47 1/2
HIP-W	37	38	39	40 1/2	42	43 1/2	45 1/2	47 1/2	49 1/2
ACROSS SHOULDER-J	14 3/4	15	15 1/4	15 1/2	15 3/4	16	16 1/4	16 1/2	16 3/4
ACROSS SHOULDER-M	14 3/4	15	15 1/4	15 1/2	15 3/4	16	16 1/4	16 1/2	16 3/4
ACROSS SHOULDER-W	14 3/4	15	15 1/4	15 1/2	15 3/4	16	16 1/4	16 1/2	16 3/4

PD 98-03 SS SHIRT

COLLAR/NECK OPTIONS

NECK SIZE	12	13	14	15	16
COLLAR	12 3/4	13 3/4	14 3/4	15 3/4	16 3/4

GARMENT FINISHED MEASUREMENTS

NAVY - SIZE	32	34	36	38	40	42	44
BUST	38	40	42	44	46	48	50
WAIST	32 3/4	34 3/4	36 3/4	38 3/4	40 3/4	42 3/4	44 3/4
HIP/SWEEP	37 1/2	39 1/2	41 1/2	43 1/2	45 1/2	47 1/2	49 1/2
ACROSS SHLD N_12	14 3/4	15	15 1/4	15 1/2	15 3/4	16	16 1/4
ACROSS SHLD N_13	15 1/4	15 1/2	15 3/4	16	16 1/4	16 1/2	16 3/4
ACROSS SHLD N_14	15 3/4	16	16 1/4	16 1/2	16 3/4	17	17 1/4
ACROSS SHLD N_15	16 1/4	16 1/2	16 3/4	17	17 1/4	17 1/2	17 3/4
ACROSS SHLD N_16	16 3/4	17	17 1/4	17 1/2	17 3/4	18	18 1/4

The size selection rules were generated for the shirts based on information provided in the previous tables. The ease ranges used to generate rules are calculated with a relationship to the standard or target ease indicated in the table.

The range of size names offered in the shirt are not the same as the body measurement chart and garments previously reviewed, therefore one size may incorporate a larger range of body measurements as identified with the larger ease range. The garment measurements and thus the ease may vary based on the intent of the designer and the use of the product.

The stock or first rule is written to provide the target and fit ease based on the designer intent. There is a minimum allowance provided on the plus and minus side of the target for minor variances. This should provide the fit designed into the garment pattern at concept. The second rule provides a larger acceptable ease range, thus including a larger range of body measurement variances from the expected body measurements for each size. The last rule includes body measurements that could not be acceptable within the fit concept of the garment. This rule is provided to capture the most extreme of body measurements.

MIL-S-87056A/PD-98 03				Neck	0.25				Shld	0.5				Bust	5	
Shirt Blue Long Sleeve	Size	Low	High	Garment	Ease	Ease	Low	High	Garment	Ease	Ease	Low	High	Garment	Ease	Ease
Stock	36/14	13.50	14.00	14.25	0.25	0.75	15.50	16.00	16.25	0.25	0.75	36	38	42	4	6
Ease range increase acceptable	36/14	13.25	14.00	14.25	0.25	1	15.00	16.00	16.25	0.25	1.25	35	39	42	3	7
Maximum ease - may alter	36/14	12.75	14.25	14.25	0	1.5	14.50	16.25	16.25	0	1.75	34	40	42	2	8

MIL-S-87056A/PD-98 03				Waist	7.75				Hip	2	4.5					
Shirt Blue Long Sleeve	Size	Low	High	Garment	Ease	Ease	Low	High	Garment	Ease	Ease					
Stock	36/14	28.25	30.75	36.75	6	8.5	36.50	38.50	41.5	3	5					
Ease range increase acceptable	36/14	27.75	31.75	36.75	5	9	35.50	39.50	41.5	2	6					
Maximum ease - may alter	36/14	26.75	33.25	36.75	3.5	10	34.50	40.00	41.5	1.5	7					

6.5 Navy Female/Male Coverall

Both the male and female navy recruit wears the Navy Coverall, CR-PD-99-18.

The coverall garment is offered in a tariff of sizes 34 through 54. The

measurements utilized in the size selection for the coverall is the across shoulder, chest/bust, seat/hip, and the waist.

SERVICE	MIL SPEC	ITEM
Navy Women's	CR-PD-99-18	Coverall

Male and Female Coverall Size Selection Methodology

The following table provides the garment finished measurements and the male body measurements compared generating an expected fit ease target. The female size tariff as utilized on other garments does not correspond to the size names used for the coverall. The female body measurements were compared to the garments measurements as a review of the fit available to the female recruit.

NAVY COVERALL

GARMENT FINISHED MEASUREMENTS

NAVY SIZE	34	36	38	40	42	44	46	48	50	52	54
CHEST	38	40	42	44	46	48	50	52	54	56	58
WAIST	33	35	37	39	41	43	45	47	49	51	53
HIP/SEAT	39	41	43	45	47	49	51	53	55	57	59
ACROSS SHOULDER	17 3/4	18 1/4	18 3/4	19 1/4	19 3/4	20 1/4	20 3/4	21 1/4	21 3/4	22 1/4	22 3/4

MALE BODY MEASUREMENTS

BASE

NAVY SIZE	34	36	38	40	42	44	46	48	50	52	54
CHEST	34	36	38	40	42	44	46	48	50	52	54
WAIST	27	29	31	33	35	37	39	41	43	45	47
HIP/SEAT	34	36	38	40	42	44	46	48	50	52	54
ACROSS SHOULDER	15 3/4	16 1/4	16 3/4	17 1/4	17 3/4	18 1/4	18 3/4	19 1/4	19 1/2	20	20 1/2

FEMALE BODY MEASUREMENTS

NAVY SIZE	4M	6M	8M	10M	12M	14M	16M	18M	20M	22M	24M	26M	28M
CHEST/BUST	32 1/2	33 1/2	34 1/2	36	37 1/2	39	41	43	45	47	49	51	53
WAIST	24 1/2	25 1/2	26 1/2	28	29 1/2	31	33	35	37	39	41	43	45
HIP/SEAT> J	33	34	35	36 1/2	38	39 1/2	41 1/2	43 1/2	45 1/2	47 1/2	49 1/2	51 1/2	53 1/2
HIP/SEAT> M	35	36	37	38 1/2	40	41 1/2	43 1/2	45 1/2	47 1/2	49 1/2	51 1/2	53 1/2	55 1/2
HIP/SEAT> W	37	38	39	40 1/2	42	43 1/2	45 1/2	47 1/2	49 1/2	51 1/2	53 1/2	55 1/2	57 1/2
ACROSS SHOULDER	14 3/4	15	15 1/4	15 1/2	15 3/4	16	16 1/4	16 1/2	16 3/4	17	17 1/4	17 1/2	17 3/4
GARMENT SIZE	34	36	38	40	42	44	46	48	50	52	54		
Male Chest Ease	4	4	4	4	4	4	4	4	4	4	4	4	4
Male Waist Ease	6	6	6	6	6	6	6	6	6	6	6	6	6
Male Hip Ease	5	5	5	5	5	5	5	5	5	5	5	5	5
Male Across Shld	2	2	2	2	2	2	2	2	2	2 1/4	2 1/4	2 1/4	2 1/4

Female Size	4J	6J	8J	10J	12J	14J	16J	18J	20J	22M	24M	26M	28M
Male Garment Size	34	34	36	38	38	40	42	44	46	48	50	52	54
Female Chest Ease	5 1/2	4 1/2	5 1/2	6	4 1/2	5	5	5	5	5	5	5	5
Female Waist Ease	8 1/2	7 1/2	8 1/2	9	7 1/2	8	8	8	8	8	8	8	8
Female Hip Ease-J	6	5	6	6 1/2	5	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2
Female Across Shld	3	2 3/4	3	3 1/4	3	3 1/4	3 1/2	3 3/4	4	4 1/4	4 1/2	4 3/4	5
Female Size	4M	6JM	8JM	10JM	12JM	14JM	16JM	18M	20M	22M	24M	26M	28M
Male Garment Size	34	34	36	38	40	42	44	46	48	50	52	54	54
Female Chest Ease	5 1/2	4 1/2	5 1/2	6	6 1/2	7	7	7	7	7	7	7	5
Female Waist Ease	8 1/2	7 1/2	8 1/2	9	9 1/2	10	10	10	10	10	10	10	8
Female Hip Ease-M	4	3	4	4 1/2	5	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	3 1/2
Female Across Shld	3	2 3/4	3	3 1/4	3 1/2	3 3/4	4	4 1/4	4 1/2	4 3/4	5	5 1/4	5
Female Size	4W	6W	8W	10W	12W	14W	16W	18W	20W	22W	24W	26W	28W
Male Garment Size	36	36	38	40	42	44	46	48	50	52	54	54	54
Female Chest Ease	7 1/2	6 1/2	7 1/2	8	8 1/2	9	9	9	9	9	9	7	5
Female Waist Ease	10 1/2	9 1/2	10 1/2	11	11 1/2	12	12	12	12	12	12	10	8
Female Hip Ease-W	4	3	4	4 1/2	5	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	3 1/2	1 1/2
Female Across Shld	3 1/2	3 1/4	3 1/2	3 3/4	4	4 1/4	4 1/2	4 3/4	5	5 1/4	5 1/2	5 1/4	5

6.6 Navy Female Overcoat and All Weather Coat

The Navy Female Overcoat and All Weather coat are issued in a range of sizes 6 through 44. The lengths are issued by height in short, regular, and long. Rules were generated to issue the female overcoat and all weather coats using the bust measurement.

SERVICE	MIL SPEC	ITEM
Navy Women's	A-A-50368A	Coat, All Weather
Navy Women's	MIL-O-24926A	Overcoat, Melton, Wool, Blue (Peacoat)

7.0 NAVY MALE SIZE SELECTION

Preliminary size selection rules were generated for the male Navy recruit. As with the Marine preliminary rule generation, patterns were utilized as well as military standards. Information was gathered from the Navy clothing issue staff and was used as a source for rule generation. The men's garments are offered in a range of sizes indicated with each garment analysis. The lengths offered are based on height as follows:

Short	5' 2" to 5' 6"	Regular	5' 7" to 5' 10"
Long	5' 11" to 6' 1"	X-Long	6' 2" to 6' 5"
XX-Long	6' 6" to 6' 9"		

The following is a list of the items reviewed for male recruits.

SERVICE	MIL SPEC	ITEM
Navy Men's	PD 99-18	Coverall, Women's Rule
Navy Men's	A-A-50367A	Coat, All Weather
Navy Men's	MIL-J-87037D	Jumper, Dress White
Navy Men's	MIL-J-87035D	Jumper, Man's Blue Dress
Navy Men's	MIL-O-2414H	Overcoat, Men's, Enlisted
Navy Men's	A-A-55297	Shirt, SS, Poplin, Cotton/Poly, White
Navy Men's	A-A-55091	Shirt, Tropical, Poly/Wool, Blue (Wash)
Navy Men's	MIL-T-87038D(NU)	Trousers, Blue, Serge, Broadfall
Navy Men's	A-A-55219	Trousers, Poly Twill, White
Navy Men's	MIL-T-41828H	Trousers, Tropical Poly/Wool, Blue (Wash)
Navy Men's	A-A-55185	Trousers, Tw, Cotton/Poly, White
Navy Men's	PD 99-18	Coverall, Men's Rule

7.1 Navy Male Trousers

Preliminary size selection rules were generated for the male Navy uniform items. Patterns for the dress trousers were received complete and were evaluated. Each is a different pattern and fit therefore, required individual size selection tables. The measurements used for the size selection on the trousers are the seat, waist, and height.

Evaluation of information obtained from patterns and military standards pertaining to the Navy men's trousers was utilized as the basis for preliminary size selection tables. The following four items were reviewed.

SERVICE	MIL SPEC	ITEM
Navy Men's	MIL-T-87038D(NU)	Trousers, Blue, Serge, Broadfall
Navy Men's	A-A-55219	Trousers, Poly Twill, White
Navy Men's	MIL-T-41828G	Trousers, Tropical Poly/Wool, Blue (Wash)
Navy Men's	A-A-55185	Trousers, Tw, Cotton/Poly, White

Trouser Size Selection Methodology

The size tariff for each style was documented and compared to the other trouser garments. The body measurement chart was compared to the size measurement chart for all four garments and expected fit ease was calculated. The size tariff for the four garments varied as well as the fit ease.

The following table displays the comparison of this information. The blue wool and white polyester trousers are issued in sizes 26 through 46 in 1" change increments. The dress lace-up and white cotton/polyester trousers are issued in sizes 26 through 50. The sizes 26 through 38 are issued in 1" change increments. The sizes larger than 38 are only offered in even number sizes or 2" change increments. The expected ease varied from trouser style to trouser style. It can be assumed this is due to the fabric choice, style of the trouser, and intended use. The size selection rules were generated using this expected ease as the standard or target.

Rule 1 for all size selection tables is based on the intended fit range. The following charts display the ranges for size 34, and as the table indicates the target ease for the seat/hip of the blue lace-up trouser is 1" and the waist for all trousers is 1".

The charts provided display the range of waist and seat measurements provided for by the rules described previously on a size 34 garment.

**GARMENT FINISHED
MEASUREMENTS**

		BASE																					
		NAVY SIZE	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
WAIST		WAIST	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
BLUE WOOL	SEAT	SEAT	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54		
WHITE POLY	SEAT	SEAT	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
NAVY SIZE	WAIST	WAIST	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
WHITE POLY	SEAT	SEAT	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
NAVY SIZE	WAIST	WAIST	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
WHITE POLY	SEAT	SEAT	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
NAVY SIZE	WAIST	WAIST	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
WHITE C/P	SEAT	SEAT	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51

BODY MEASUREMENTS

		SEAT EASE																					
		NAVY SIZE	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
WAIST		WAIST	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
WHITE C/P	SEAT	SEAT	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
NAVY SIZE	WAIST	WAIST	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
WHITE C/P	SEAT	SEAT	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

		5.5 Inch Minimum Drop
Waist	33.5	
Seat	39	
Waist	32.5	
Seat	40	
Waist	34.5	
Seat	39	
Waist	32.5	
Seat	40	
Waist	34.5	
Seat	38	
Waist	32.5	
Seat	40	
Waist	34.5	
Seat	38	
Waist	32.5	
Seat	40	
Waist	35	
Seat	37.5	
Waist	32	
Seat	40	

WAIST	32	32.5	33	33.5	34	34.5	35	
	32.5 -	34.5						
SEAT	37.5	38	38.5	39	39.5	40	40.5	41
	39 -	40						

Overview of Navy Men's Blue Trouser

Rule 1 for all size selection tables is based on the intended fit range. These ease ranges are centered around the standard or target ease.

Rule 2 utilizes the ability to "let the waist out 1 inch" with the design of the lace-up back. The range for the waist measurement was expanded to include a waist 1-inch larger than the previous rule set. This allows each garment to fit a recruit who has the hip/seat appropriate to the size 34 but has a waist one size larger or size 35.

Rule 3 retained the larger waist range from Rule 2 utilizing the lace-up feature of the garment. The seat/hip range was modified to include a hip measurement one size smaller than Rule 2. In effect the recruit could have a 2-size difference between his waist and seat.

Rule 4 expanded the waist and seat/hip rule to the maximum possible. This rule allows even a larger size difference between the waist and seat/hip. If a recruits measurement flowed through the size selection table to Rule 4 alterations might be necessary.

The rules for the other trousers were generated with the same methodology but with different parameters. Waist alteration outlets were provided in the trouser styles without the lace-up. Rules were based on increasing or decreasing the waist utilizing these outlets. A table is provided displaying the basis for the size selection tables for all four trouser garments in the appendix.

MIL-T-87038D				Seat	1"				Waist	1"	
Trousers, Men's Blue (Laced)	Size	Lower	Upper	Garment	Ease	Ease	Lower	Upper	Garment	Ease	Ease
Stock Seat and Waist	34	39	40	41	1	2	32.5	33.5	34	0.5	1.5
Stock Seat and Lace +1 ease	34	39	40	41	1	2	32.5	34.5	34	-0.5	1.5
Up one size in seat ease	34	38	40	41	1	3	32.5	34.5	34	-0.5	1.5
Max range on seat and waist	34	37.5	40	41	1.0	3.5	32	35	34	-1	2.0

7.2 Navy Male Jumpers

Evaluation of information obtained from patterns and military standards pertaining to the Navy men's jumpers was utilized as the basis for preliminary size selection tables. The following two jumpers were reviewed.

SERVICE	MIL SPEC	ITEM
Navy Men's	MIL-J-87037D	Jumper, Dress White
Navy Men's	MIL-J-87035D	Jumper, Man's Blue Dress

The size tariff for each style was documented and compared to the other garment. The body measurement chart was compared to the size measurement chart for both jumpers and the expected fit ease was calculated. The size tariff for both garments included 30 through 52 based on a 2-inch chest change.

Jumper Size Selection Methodology

The following table displays the comparison of this information. The comparison of the chest body measurement to the garment measurement for each jumper shows that the white jumper fits with a standard chest ease of 4 inches verses the blue jumper with a standard chest ease of 3 inches. The waist ease is larger for the white jumper as expected based on the chest difference. The sweep or hipline/seat ease is the same for both jumpers, 1-inch difference between the garment and the body measurement. The across shoulder ease was different between the two garments as well as through the distribution of sizes. The body measurement chart derived is based on assumptions made from the information collected, standard body measurement charts, the pattern measurements, and general fit knowledge. The across shoulder body measurements increase and decrease consistently based on the chest measurements.

GARMENT FINISHED MEASUREMENTS

BASE

White Jumper	30	32	34	36	38	40	42	44	46	48	50	52
CHEST	34	36	38	40	42	44	46	48	50	52	54	56
WAIST	30	32	34	36	38	40	42	44	46	48	50	52
HIP/SWEEP	31	33	35	37	39	41	43	45	47	49	51	53
ACROSS SHOULDER	16 1/8	16 1/2	16 7/8	17 1/4	17 5/8	18	18 3/8	18 3/4	19 1/8	19 1/2	19 7/8	20 1/4

Blue Jumper	30	32	34	36	38	40	42	44	46	48	50	52
CHEST	33	35	37	39	41	43	45	47	49	51	53	55
WAIST	28	30	32	34	36	38	40	42	44	46	48	50
HIP/SWEEP	31	33	35	37	39	41	43	45	47	49	51	53
ACROSS SHOULDER	15 7/8	16 1/4	16 3/4	17 1/8	17 5/8	18	18 1/2	18 7/8	19 3/8	19 3/4	20 1/4	20 5/8

BODY MEASUREMENTS

BASE

NAVY SIZE	30	32	34	36	38	40	42	44	46	48	50	52
CHEST	30	32	34	36	38	40	42	44	46	48	50	52
WAIST	23	25	27	29	31	33	35	37	39	41	43	45
HIP/SWEEP	30	32	34	36	38	40	42	44	46	48	50	52
ACROSS SHOULDER	14 3/4	15 1/4	15 3/4	16 1/4	16 3/4	17 1/4	17 3/4	18 1/4	18 3/4	19 1/4	19 1/2	20

EASE	30	32	34	36	38	40	42	44	46	48	50	52
Wh Jp Chest Ease	4	4	4	4	4	4	4	4	4	4	4	4
BL Jp Chest Ease	3	3	3	3	3	3	3	3	3	3	3	3
Wh Jp Waist Ease	7	7	7	7	7	7	7	7	7	7	7	7
BL Jp Waist Ease	5	5	5	5	5	5	5	5	5	5	5	5
Wh Jp Sweep Ease	1	1	1	1	1	1	1	1	1	1	1	1
BL Jp Sweep Ease	1	1	1	1	1	1	1	1	1	1	1	1
Wh Jp Acr Shl Ease	1 3/8	1 1/4	1 1/8	1	7/8	3/4	5/8	1/2	3/8	1/4	3/8	1/4
BL Jp Acr Shl Ease	1 1/8	1	1	7/8	7/8	3/4	3/4	5/8	5/8	1/2	3/4	5/8

Rule Methodology

The size selection rules were generated for the white and blue men's jumper based on the information provided in the previous table. The ease ranges used to generate rules are generated with a specific relationship to the standard or target ease. In some cases the target ease is in the center of the stock ease range and in other cases it is not. If the standard fit ease for a specific measurement is small then the changes allowed for reduced ease will not be utilized as much as the allowance for larger fit ease. If the standard fit ease for a specific measurement is large then the changes allowed for increased ease will not be utilized as much as the allowance for smaller fit ease. Therefore, the target is not necessarily in the center of the range for all rules.

The information available did not provide any allowances for alteration. In extreme cases alterations may be required therefore; the last rule allows ranges that may require alterations to meet fit requirements. When a size larger or smaller is necessary for a particular measurement, all garment measurements are changed because the garment issued must be selected up or down one size instead of modifying the specific area required for the particular measurement. When alterations are allowed, changing only one garment measurement creates different silhouettes. Preliminary size selection rules can be adjusted when size selection fit data from scanning tests are available.

The following table provides an example of some of the recruit body shapes that may be fitted. When alterations are not allowed, generally the larger body measurements drive the size selection. When the garment chest measurement grade is in 1-inch increments, the need for larger and smaller ranges is less than when the garment chest measurement grade is in 2-inch increments as with the jumper garment. This means that when a recruit is fitted with a garment one size larger or smaller because of a particular body measurement, the minimum change is 2 inches. Basically only half as many sizes are available as when the chest change is 1-inch. The allowances for increased and decreased ease versus the standard are larger due to the tariff available. The style of the garment must allow for a more versatile fit criterion versus a constructed dress coat.

The first two-row table provides the body measurement standard for a size 38 and a size 40 jumper. The following table indicates the recruit size for each of the body measurements as compared to the standard in the first two-row table. The size that the rules would issue is in the last column. The example named "Small Seat Size" would wear a 40 jumper in the chest and a 40 jumper in the waist and a 38 jumper in the seat. The "Body Measurement" row indicates these sizes from the previous table of body measurements.

The chest body measurement of 40 requires a 40 jumper, the waist body measurement of 33 requires a 40 jumper, but the seat of 38.5 body measurement requires a 38 jumper to meet the standard or target fit ease. The rules allowed an increase in the seat ease to fit the chest and waist near the standard by issuing a size 40 jumper. In this case, the jumper seat ease is very small therefore an increase is acceptable. In the examples where there is one larger measurement, that measurement usually drives the size to be issued up one. These examples are using the maximum of one full size change in body measurements. In other cases where the difference between the body measurements is not near 2 inches or a whole additional size, the size may not be driven by the extreme measurement and the allowed acceptable ease may be adjusted.

	Chest	Waist	Seat
Size 38 Garment Body Measurement	38	31	38
Size 40 Garment Body Measurement	40	33	40

	Chest	Waist	Seat	RULE ISSUE
Small Seat Size	40	40	38	40
Body Measurement	40	33	38.5	

	Chest	Waist	Seat	Issue
Small Waist	40	38	40	
Body Measurement	40	31.5	40	40
Small Chest	38	40	40	
Body Measurement	38.5	33	40	40
Large Seat	40	40	42	
Body Measurement	40	33	42	42
Large Waist	40	42	40	
Body Measurement	40	35.5	40	42
Large Chest	42	40	40	
Body Measurement	42	33.5	40.5	42
Small Waist and Seat	40	38	38	
Body Measurement	40	31.5	38.5	40
Small Chest and Waist	38	38	40	
Body Measurement	38	31	40	40
Small Chest and Seat	38	40	38	
Body Measurement	38	33	38	38

The following table is an illustration of the white man's jumper rule methodology. A sample of all jumper rules is included in the appendix.

MIL- J- 87037D				Shld	3/4 - 1"				Chest	4"	
Jumper, Man's White	Size	Low	High	Garment	Ease	Ease	Low	High	Garment	Ease	Ease
Stock	40	17	17.5	18.000	0.5	1	39	41	44	3	5
Accept Ease Range Increase	40	16.50	17.50	18.00	0.5	1.5	38	42	44	2	6
Unacceptable Ease - Alter	40	16.50	17.50	18.00	0.5	1.5	38	42	44	2	6
MIL- J- 87037D				Waist	7"				Seat	1"	
Jumper, Man's White	Size	Low	High	Garment	Ease	Ease	Low	High	Garment	Ease	Ease
Stock	40	32	34	40	6	8	39	40	41	1	2
Accept Ease Range Increase	40	32	37	40	3	8	37.5	40	41	1	3.5
Unacceptable Ease - Alter	40	32	38	40	2	8	36	40	41	1	5

7.3 Navy Male Shirts

Evaluation of information obtained from patterns and military standards pertaining to the Navy men's long sleeve and short sleeve shirt was utilized as the basis for preliminary size selection tables. The following two garments were reviewed.

SERVICE	MIL SPEC	ITEM
Navy Men's	A-A-55279	Shirt, SS, Poplin, Cotton/Poly, White
Navy Men's	A-A-55091	Shirt, Tropical, Poly/Wool, Blue (Wash)

The long sleeve shirt is offered in neck sizes 12 through 18 at $\frac{1}{2}$ inch intervals resulting in 13 possible neck sizes in various sleeve lengths. The short sleeve shirt is offered in sizes X-Small through XXX-Large, a total of 7 sizes. The following table shows the garment measurements and appropriate body measurements resulting in the fit ease for each size for both garments. The smallest size in the short sleeve shirt is equivalent in neck size to the 13 $\frac{1}{2}$ long sleeve shirt. Therefore, all recruits smaller than 13 $\frac{1}{2}$ inches in the long sleeve shirt would receive the smallest shirt possible in the short sleeve.

The following table displays the comparison of this information. The neck ease standard calculated was $\frac{1}{2}$ inch for the long and short sleeve shirt. This is the expected minimum ease in the neck. The long sleeve shirt appears to fit in the chest at 8 inches of ease as compared to the short sleeve shirt at 5 inches. The across shoulder follows the same fit as the chest measurement, as expected with a larger ease in the long sleeve across shoulder than the short sleeve shirt.

Long Sleeve Shirt	12	12 1/2	13	13 1/2	14	14 1/2	15	15 1/2	16	16 1/2	17	17 1/2	18
NECK	12 1/2	13	13 1/2	14	14 1/2	15	15 1/2	16	16 1/2	17	17 1/2	18	18 1/2
CHEST	38	38 3/4	39 1/2	41	42 1/2	44	45 1/2	47	49	51	53	55	57
WAIST	33 1/4	34	34 3/4	35 1/2	37	38 1/2	40	41 1/2	43 1/2	45 1/2	47 1/2	49 1/2	51 1/2
HIP/SWEEP	34 1/4	35	35 3/4	36 1/2	38	39 1/2	41	42 1/2	44 1/2	46 1/2	48 1/2	50 1/2	52 1/2
ACROSS SHOULDER	16 7/8	17 3/8	17 3/4	18 1/4	18 5/8	19	19 1/2	20	20 3/8	20 7/8	21 1/4	21 3/4	22 1/8

Short Sleeve Shirt	X-SMALL	SMALL	MEDIUM	LARGE	X-L	XX-L	XXX-L
NECK	14	15	16	17	18	19	20
CHEST	37	41	45	49	53	57	61
WAIST	33	37	41	45	49	53	57
HIP/SWEEP	37	41	45	49	53	57	61
ACROSS SHOULDER	16 1/2	17 1/2	18 1/2	19 1/2	20 1/2	21 1/2	22 1/2

BODY MEASUREMENTS														BASE				
NAVY SIZE	12	12.5	13	13.5	14	14.5	15	15.5	16	16.5	17	17.5	18	18.5	19.5			
NECK	12	12.5	13	13.5	14	14.5	15	15.5	16	16.5	17	17.5	18	18.5	19.5			
CHEST	28	29	30	32	34	36	38	40	42	44	46	48	50	52	56			
ACROSS SHOULDER	14 1/4	14 1/2	14 3/4	15 1/4	15 3/4	16 1/4	16 3/4	17 1/4	17 3/4	18 1/4	18 3/4	19 1/4	19 1/2	20	21			

NAVY SIZE	12	12 1/2	13	13 1/2	14	14 1/2	15	15 1/2	16	16 1/2	17	17 1/2	18	18 1/2	19 1/2		
L/S Shirt Neck Ease	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2			
S/S Shirt Neck Ease				1/2		1/2		1/2		1/2		1/2		1/2	1/2		
L/S Shirt Chest Ease	10	9 3/4	9 1/2	9	8 1/2	8	7 1/2	7	7	7	7	7	7				
S/S Shirt Chest Ease				5		5		5		5		5		5	5		
L/S Shirt Acr Shld Ease	2 5/8	2 7/8	3	3	2 7/8	2 3/4	2 3/4	2 3/4	2 5/8	2 5/8	2 1/2	2 1/2	2 5/8				
S/S Shirt Acr Shld Ease				1 1/4		1 1/4		1 1/4		1 1/4		1 1/4		1 1/2	1 1/2		

Rule Methodology

The size selection rules were generated for the long sleeve and short sleeve shirt based on formation provided in the previous table. The ease ranges used to generate rules are calculated with a specific relationship to the standard or target ease. The target ease for the neck determined the body-size relationship for the short sleeve shirt, which was issued in X-Small etc. instead of neck sizes.

The shirts are issued from stock without alterations. The rules were generated with the first rule fitting a body measurement range based on minor allowances in the plus and minus direction of the target for each measurement. This should provide the fit designed into the garment pattern at concept. The second rule provides a larger acceptable ease range, thus including a larger range of different body shapes. The last rule includes body measurements that could not be acceptable within the fit concept of the garment. This rule is provided to capture the most extreme of body measurements. The following table is an illustration of the long sleeve shirt rule methodology. A sample of all shirt rules is included in the appendix.

A-A-55091				Neck	1/2"				Shld	2.5-3.0"				Chest	10-7"	
Shirt, Man's Blue Poly/Wool LS Shirt	Size	Low	High	Garment	Ease	Ease	Low	High	Garment	Ease	Ease	Low	High	Garment	Ease	Ease
Stock	15 1/2	15.00	15.50	16.00	0.5	1	17.00	18.00	20.00	2	3	39.00	41.00	47.00	6	8
Accept Ease Range Increase	15 1/2	14.50	16.00	16.00	0	1.5	17.00	18.50	20.00	1.5	3	39.00	42.00	47.00	5	8
Non Standard Fit- May need alter	15 1/2	14.00	16.00	16.00	0	2	16.50	19.00	20.00	1	3.5	38.00	43.00	47.00	4	9

7.4 Navy Male Coverall

Both the male and female navy recruit wears the Navy Coverall, CR-PD-99-18. The coverall garment is offered in a tariff of sizes 34 through 54. The measurements utilized in the size selection for the coverall is the across shoulder, chest/bust, seat/hip, and the waist. The male size selection rule methodology is included in the section 6.5.

SERVICE	MIL SPEC	ITEM
Navy Men's	PD 99-18	Coverall, Men's Rule

7.5 Navy Male Overcoat and All Weather Coat

The Navy Male Overcoat is issued in a range of sizes 30 through 52. The All Weather Coat is issued in a range of sizes 28 through 52. The lengths are issued by height in short, regular, long and x-long. Rules were generated to issue the male overcoat and all weather coats using the chest measurement.

SERVICE	MIL SPEC	ITEM
Navy Men's	A-A-50367A	Coat, All Weather
Navy Men's	MIL-O-2414H	Overcoat, Men's, Enlisted

8.0 CONCLUSIONS

The analysis of the female clothing issue process and sizing structure varies from service to service. Some of processes were developed based on the criteria of physical accommodations for the issuing process as well as the number of recruits processed each time period. First try-on size prediction was handled by taking several measurements per clothing item to taking no measurements at all or issuing based on visual observation only.

Utilizing size prediction tables generated with given measurement ranges reduces the opportunity for variance in first size issued. Size prediction tables associated with the 3-D body scan provided by ARNScan can result in better accuracy, consistency, and objectivity in the size selection process.

APPENDIX

PRELIMINARY SIZE SELECTION RULE METHODOLOGY

			HIP			Waist			Thighs	
	Size	Low	High	Garment	Ease	Low	High	Garment	Ease	Low
Marine Skirts, Women's										
No hip alteration	12	39.5	41	42	1	2.5	27.5	31	30	-1
Alter hip +2 alter waist +1 -1.5	12	37.5	41	42	1	4.5	27.5	31	30	-1
Alter hip +2 alter waist +1 -1.5	12	39	42.5	41.5	-1	2.5	28.5	32	31	-1
Alter hip +2 alter waist +1 -1.5	12	37	42.5	41.5	-1	4.5	28.5	32	31	-1

			HIP			Waist			Thigh	
	Size	Low	High	Garment	Ease	Low	High	Garment	Ease	Low
Marine Slacks, Women's										
No hip alteration	12	39.5	41.5	42.5	1	3	27.5	31	30	-1
Alter hip +1 alter waist +1 -1.5	12	38.5	41.5	42.5	1	4	27.5	31	30	-1
Alter hip +1 alter waist +1 -1.5	12	39.5	42.5	42.5	0	3	27.5	31	30	-1
Alter hip +1-1 alter waist +1 -1.5	12	37.5	42.5	42.5	0	5	27	31	30	-1

			Bust			Shld			Waist			Hip	
	Size	Low	High	Garment	Ease	Low	High	Garment	Ease	Low	High	Garment	Ease
Marine Coat, Woman's Poly/Wool, Blue Stock	12	38.0	39.5	42.5	3	4.5	15.75	16.50	17.50	1	1.75	30.00	31.50
Ease Range Increase	12	37.5	39.5	42.5	3	5	15.75	17.00	17.50	0.5	1.75	29.25	32.25
Ease Range Increase - Alter	12	36.5	39.5	42.5	3	6	15.75	17.00	17.50	0.5	1.75	28.25	33.25

			Bust			Hip			Waist			Shld		Neck
	Size	Low	High	Gmt	Ease	Low	High	Gmt	Ease	Low	High	Gmt	Ease	Ease
Marine Shirts, Women's Long & Short Sleeve Stock	12	37.00	39.00	43.00	4	6	36.50	38.50	41.88	3.4	5.4	29.00	31.00	34.75
Ease Range Increase	12	37.00	39.50	43.00	3.5	6	36.50	38.88	41.88	3	5.4	29.00	31.75	34.75
Maximum ease - minus alter	12	36.00	39.50	43.00	3.5	7	34.88	38.88	41.88	3	7	27.75	31.75	34.75

ML-S29631			HIP	1.5	2.5			Waist	0	0		Thighs	3.5	5.25
Navy Female SDB Skirt	Size	Lower	Upper	Garment	Ease	Lower	Upper	Garment	Ease	Lower	Upper	Garment	Ease	Ease
Stock	10M	37.50	38.50	40	1.5	2.5	26.50	27.50	28	0.5	1.5	37.00	40.00	42
Ease range increase acceptable	10M	36.00	38.50	40	1.5	4	26.00	27.50	28	0.5	2	37.00	40.00	42
Maximum ease - may alter	10M	35.00	38.50	40	1.5	5	25.00	27.50	28	0.5	3	35.00	40.50	42

ML-S29629			HIP	2.25	2.50			Waist	0	0		Thighs	4.3	4.8
Navy Female SDW - WB - SW Skirt	Size	Lower	Upper	Garment	Ease	Lower	Upper	Garment	Ease	Lower	Upper	Garment	Ease	Ease
Stock	10M	38.25	39.25	40	3/4	1.5	2.5	26.50	27.50	28	0.5	1.5	37.75	40.75
Ease range increase acceptable	10M	36.25	39.25	40	3/4	1.5	4.5	26.00	27.50	28	0.5	2	36.75	40.75
Maximum ease - may alter	10M	35.25	39.25	40	3/4	1.5	5.5	25.00	27.50	28	0.5	3	35.75	41.25

ML-S24948A Type I			HIP	2.5	3.5			Waist	0	0		Thigh	2.5	3
Navy Female SDW - WB - SW Slack	Size	Lower	Upper	Garment	Ease	Lower	Upper	Garment	Ease	Lower	Upper	Garment	Ease	Ease
Stock	10M	38.00	39.00	41	1/2	2.5	3.5	26.50	27.50	28	0.5	1.5	33.00	25.00
Increase in hip ease	10M	37.00	39.00	41	1/2	2.5	4.5	26.50	27.50	28	0.5	1.5	22.00	25.00
Waist ease - 1.0 inch alter	10M	37.00	39.00	41	1/2	2.5	4.5	25.50	27.50	28	0.5	2.5	22.00	25.00
Maximum ease - +/- 1.0 waist alter	10M	36.00	40.00	41	1/2	1.5	5.5	25.50	28.50	28	-1	2.5	21.00	25.50

ML-S24948A Type II			HIP	1.75	2.3			Waist	0	0		Thigh	2	2.5
Navy Female SDW - WB - SW Slack	Size	Lower	Upper	Garment	Ease	Lower	Upper	Garment	Ease	Lower	Upper	Garment	Ease	Ease
Stock	10M	37.75	38.75	40	1/4	1.5	2.5	26.50	27.50	28	0.5	1.5	22.50	24.50
Increase in hip ease	10M	36.75	38.75	40	1/4	1.5	3.5	26.50	27.50	28	0.5	1.5	21.50	24.50
Waist ease - 1.0 inch alter	10M	36.75	38.75	40	1/4	1.5	3.5	25.50	27.50	28	0.5	2.5	21.50	24.50
Max ease & +/- 1.0 waist alter	10M	35.25	39.00	40	1/4	1.25	5.0	25.50	28.50	28	-1	2.5	20.50	25.00

MIL-S29630			HIP	2.5	2.8			Waist	0	0		Thigh	2.5
Navy Female SDB Slack	Size	Lower	Upper	Garment	Ease	Lower	Upper	Garment	Ease	Lower	Upper	Garment	Ease
Stock	10M	38.00	38.75	41	2.25	3.0	26.50	27.50	28	0.5	1.5	22.50	24.50
Increase in hip ease	10M	37.00	38.75	41	2.25	4.0	26.50	27.50	28	0.5	1.5	21.50	24.50
Waist ease -1.0 inch alter	10M	37.00	38.75	41	2.25	4.0	25.50	27.50	28	0.5	2.5	21.50	24.50
Max ease- +/- 1.0 waist alter	10M	36.00	39.25	41	1.75	5.0	25.50	28.50	28	-1	2.5	20.50	25.00
												26.1/2	1.5
												6	

MIL- C-29628			Across	Shld	0.5			Bust	3			Waist	4.5	
Navy Female Coat, Svc Dress Blue	Size	Low	High	Garment	Ease	Low	High	Garment	Ease	Low	High	Garment	Ease	
Stock	10M	15.25	15.75	16.00	0.25	0.75	35.0	37.0	39.0	2	4	27.0	29.0	
Ease range increase acceptable	10M	15.00	15.75	16.00	0.25	1	34.0	37.0	39.0	2	5	26.0	29.5	
Maximum ease - may alter	10M	14.75	16.00	16.00	0	1.25	33.0	37.5	39.0	1.5	6	26.0	29.5	
MIL- J - 24949			Across	Shld	0.5	2.25		Bust	3.75			Waist	12	
Navy Female Jumper, Svc Dress White	Size	Low	High	Garment	Ease	Low	High	Garment	Ease	Low	High	Garment	Ease	
Stock	10M	14.00	16.00	16.50	0.5	2.5	35.00	37.00	39.75	2.75	4.8	26.0	30.0	
Ease range increase acceptable	10M	13.50	16.00	16.50	0.5	3	34.00	37.75	39.75	2	5.8	26.0	31.0	
Maximum ease - may alter	10M	13.00	16.00	16.50	0.5	3.5	32.75	38.25	39.75	1.5	7	25.0	32.0	

MIL- S - 87056A			Neck					Bust				Waist		
Navy Female Shirt Blue	Size	Low	High	Gmt	Ease	Ease	Low	High	Gmt	Ease	Ease	Low	High	
Stock	36/14	13.50	14.00	14.25	0.25	0.75	15.50	16.00	16.25	0.25	0.75	36	38	
Ease range increase	36/14	13.25	14.00	14.25	0.25	1	15.00	16.00	16.25	0.25	1.25	35	39	
Maximum ease - may alter	36/14	12.75	14.25	14.25	0	1.5	14.50	16.25	16.25	0	1.75	34	40	

PD 98-03				Neck																						
Navy Female Shirt Short Sleeve	Size	Low	High	Gmt	Ease	Low	High	Gmt	Ease	Low	High	Gmt	Ease	Low	High	Gmt	Ease	Hip	Ease							
Stock	36/14	13.50	14.00	14.25	0.25	0.75	15.50	16.00	16.25	0.25	0.75	36	38	42	4	6	28.25	30.75	36.75	6	8.5	36.50	38.50	41.5	3	5
Ease range increase accept	36/14	13.25	14.00	14.25	0.25	1	15.00	16.00	16.25	0.25	1.25	35	39	42	3	7	27.75	31.75	36.75	5	9	35.50	39.50	41.5	2	6
Maximum ease - may alter	36/14	12.75	14.25	14.25	0	1.5	14.50	16.25	16.25	0	1.75	34	40	42	2	8	26.75	33.25	36.75	3.5	10	34.50	40.00	41.5	1.5	7

CR-PD 99-18 (FEMALE)				Across	Shld				Bust												
Coveralls, Utility	Size	Low	High	Garment	Ease	Low	High	Garment	Ease	Low	High	Garment	Ease	Low	High	Garment	Ease	Ease	Ease		
Stock - Miss Ease	38	15.5	16	18.75	2.75	3.25	34	37.5	42	4.5	8	36	39.5	43	3.5	7	26	29.5	37	7.5	11
Ease Range Increase	38	12.75	16.75	18.75	2	6	33	38.5	42	3.5	9	34	40.5	43	2.5	9	24	31.5	37	5.5	13
Max Ease Range	38	12.75	17.25	18.75	1.5	6	33	39.5	42	2.5	9	34	41	43	2	9	24	33	37	4	13

CR-PD 99-18 (MALE)				Shld					Chest												
Coveralls, Utility	Size	Low	High	Garment	Ease	Ease	Low	High	Garment	Ease	Low	High	Garment	Ease	Ease	Low	High	Garment	Ease	Ease	
Stock	40	16.75	17.75	19.25	1.5	2.5	39	41	44	3	5	39	41	45	4	6	32	34	39	5	7
Accept Ease Range Increase	40	15.75	18.25	19.25	1	3.5	38	41.5	44	2.5	6	37	41.5	45	3.5	8	30	35	39	4	9
Unacceptable Ease - Alter	40	14.75	18.25	19.25	1	4.5	36	41.5	44	2.5	8	37	41.5	45	3.5	8	28	36	39	3	11

MIL-T-87038D				Seat	1"															
Navy Trousers, Men's Blue (Laced)	Size	Lower	Upper	Garment	Ease	Ease	Lower	Upper	Garment	Ease	Ease	Lower	Upper	Garment	Ease	Ease	Lower	Upper	Garment	Ease
Stock Seat and Waist	34	39	40	41	1	2	32.5	33.5	34	0.5	1.5									
Stock Seat and Lace +1 ease	34	39	40	41	1	2	32.5	34.5	34	-0.5	1.5									
Up one size in seat ease	34	38	40	41	1	3	32.5	34.5	34	-0.5	1.5									
Max range on seat and waist	34	37.5	40	41	1.0	3.5	32	35	34	-1	2.0									

AA-55185			Seat	2"							
Navy Trousers, Men's White Cotton/Poly	Size	Lower	Upper	Garment	Ease	Lower	Upper	Garment	Ease	Waist	1"
Stock	34	39.5	40.5	42	1.5	2.5	32.5	33.5	34	0.5	1.5
Seat ease increase	34	39	41	42	1	3	32.5	33.5	34	0.5	1.5
Waist ease decrease -7/8 alteration allowed	34	39	41	42	1	3	32	33.5	34	0.5	2
Waist ease increase +7/8 alteration allowed	34	39	41	42	1	3	32	34	34	0	2

AA-55219			Seat	2"							
Navy Trousers, Men's White Polyester	Size	Lower	Upper	Garment	Ease	Lower	Upper	Garment	Ease	Waist	1"
Stock	34	39.5	40.5	42	1.5	2.5	32.5	33.5	34	0.5	1.5
Increase seat ease	34	39	41	42	1	3	32.5	33.5	34	0.5	1.5
Waist ease decrease -1.25 alteration allowed	34	39	41	42	1	3	31.5	33.5	34	0.5	2.5
Waist ease increase +1.25 alteration allowed	34	39	41	42	1	3	31.5	34.5	34	-0.5	2.5

MIL-T-41828H			Seat	4"							
Navy Trousers, Men's Blue Wool	Size	Lower	Upper	Garment	Ease	Lower	Upper	Garment	Ease	Waist	1"
Stock	34	40	41	44	3	4	32.5	33.5	34	0.5	1.5
Decrease seat ease	34	40	42	44	2	4	32.5	33.5	34	0.5	1.5
Waist ease decrease -1.25 alteration allowed	34	40	42	44	2	4	31.5	33.5	34	0.5	2.5
Waist ease increase +1.25 alteration allowed	34	40	42	44	2	4	31.5	34.5	34	-0.5	2.5

MIL-J-87035D			Shld	3/4 - 1"		Chest	3"			Waist	5"		Seat	1"
Navy Jumper, Man's Blue Dress	Size	Lower	Upper	Garment	Ease	Lower	Upper	Garment	Ease	Lower	Upper	Garment	Ease	Ease
Stock	40	17.00	17.50	18.00	0.5	1	39	41	43	2	4	32	34	4
Accept Ease Range Increase	40	16.50	17.50	18.00	0.5	1.5	38	41.5	43	1.5	5	31	35	3
Unacceptable Ease - Alter	40	16.50	17.50	18.00	0.5	1.5	37	41.5	43	1.5	6	30	36	38

A-A-55091			Neck	1/2"			Shld	2.5-3.0"				Chest	10-7"	
Navy Shirt, Man's Blue Poly/Wool LS Shirt	Size	Lower	Upper	Garment	Ease	Lower	Upper	Garment	Ease	Lower	Upper	Garment	Ease	Ease
Stock	15 1/2	15.00	15.50	16.00	0.5	1	17.00	18.00	20.00	2	3	39.00	41.00	47.00
Accept Ease Range Increase	15 1/2	14.50	16.00	16.00	0	1.5	17.00	18.50	20.00	1.5	3	39.00	42.00	47.00
Non Standard Fit- May need alter	15 1/2	14.00	16.00	16.00	0	2	16.50	19.00	20.00	1	3.5	38.00	43.00	47.00

A-A-55297			Neck	1/2"			Shld	1 1/4"				Chest	5"	
Navy Shirt, Man's White Poly/Cot SS Shirt	Size	Lower	Upper	Garment	Ease	Lower	Upper	Garment	Ease	Lower	Upper	Garment	Ease	Ease
Stock	M	15	15.5	16	0.5	1	16.8	17.75	18.5	0.75	1.75	39	41	45
Accept Ease Range Increase	M	14.5	16	16	0	1.5	16.5	18	18.5	0.5	2	38	42	45
Non Standard Fit- May need alter	M	14	16	16	0	2	16	18.25	18.5	0.25	2.5	37	43	45